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COVER: In the boiler room of the USS *Sterett*, Secretary of the Navy J. William Middendorf II tests the prototype of a new electronic heat stress meter with digital readout. Assisting him is CDR A.R. Dasler (MSC), head of the Heat Stress Division, Naval Medical Research Institute. For more about Navy Medical Department efforts to keep crews cool, see "Taking the Stress Out of Heat," beginning on page 1.

Department Rounds

Taking the Stress Out of Heat

"I never even heard about heat stress back then," said Secretary of the Navy J. William Middendorf II during a recent radio interview, remembering his World War II days in the Pacific. "Men would just pass out, you know. You'd get them up to topside, dump a bucket of water on them, and put them back in the engine room."

Today, thanks to steady advances in understanding heat stress, the Navy knows there are better ways to keep crews cool. And Secretary Middendorf has directed a Navy-wide assault on excessive heat stress in the fleet. Here's what is being done:

- The Secretary is personally zeroing in on the problem of heat stress when he visits ships. Accompanied by CDR Adolph R. Dasler (MSC), head of the Heat Stress Division at Naval Medical Research Institute (NMRI), Secretary Middendorf toured Navy ships in the Western Pacific last December, checking temperature and humidity in boiler and engine rooms, galleys, sculleries and other hot spots. "The word's gotten out," he said on a "Navy Scene" broadcast. "They all know I'm going to ask about heat stress. When I go aboard a ship, nobody ever invites me into the wardroom any more. They tell me, 'We're ready to take you down into the engine room and the crew's quarters.'"

- A revised heat stress directive—OPNAV Instruction 5100.20A—came out in April. The updated instruction, which applies to all surface ships, tells how to use the wet bulb globe temperature meter to determine how long crewmembers can remain in hot, humid spaces without ill effects. The instruction also lists key deficiency areas and describes how to report

hazardous levels of heat. Engineering departments will now monitor heat stress in their work areas, while medical department personnel survey conditions in other potentially hot spaces.

- Two other documents dealing with heat stress are being revised: BUMED Instruction 6200.7, Prevention of Heat Casualties, and the tri-service bulletin *Etiology, prevention, diagnosis and treatment of adverse effects of heat* (TB MED 175/NAVMED P-5052-S/AFP 160-1).

- A five-year study of boiler technicians, machinist mates and sonarmen begins early in FY77. The study will determine whether limits established for acute exposure to heat are also valid for individuals exposed to long-term, repeated heat stress. According to CDR Dasler, there is no definitive physiological data to show whether long-term heat stress has a different effect on work performance than short-term heat exposure. Also unknown are the consequences of long-term heat exposure in industrial settings.

Already approved and funded by the Chief of Naval Operations, the study will follow selected boiler technicians, machinist mates and sonarmen from service school through their first enlistment. Before the men report to their ships, they will be examined by members of the NMRI Heat Stress Division. Then they will be assigned to routine duty aboard ship, where their health will be monitored continually. The men will undergo a second physiological evaluation at NMRI before the end of their first enlistment.

Boiler technician aboard USS *Johnson*
Five year study planned

- Two new color movies dramatizing the dangers of heat stress are now in production. In one, the "heat stress monster"—complete with horns, tail and trident—describes how heat affects health and physical performance, and gives tips on how to ward off heat stress. The second film describes the responsibilities of supervisors in dealing with heat stress. These 20-minute films will be available through the Health Sciences Education and Training Command.

There's more to come: in early 1977, the Navy will introduce an electronic heat stress meter that is smaller, faster, more reliable and more durable than units now used. Built to specifications set by NMRI and the Naval Medical Research and Development Command, this new wet bulb globe temperature meter will feature a digital readout. There will be only two movable pieces instead of the nine pieces found in units now used by the fleet.



On the Run

When you hit age 40 and go for a physical, it's not unusual to find out you're mildly hypertensive and overweight. That's what happened to CAPT Robert E. Strange (MC), a Navy psychiatrist and director of the Medical Corps Division at the Bureau of Medicine and Surgery. But while most 40-year-olds think hypertension is inevitable at their age and control it with medication, CAPT Strange headed for the streets—in his running shoes.

He's not alone: LT Nathan Sessions (MSC), HM2 Gerald Engelbrecht, LT Sandra B. Doppelheuer (MSC, USNR-R), and a galloping herd of other Medical Department members are also running after a stronger heart and a sleeker appearance.

The Navy would like all its members to get smart about physical fitness. Because operational readiness depends on each member's top condition, a "shape up or ship out" campaign has been launched to get warmup suits on and spare tires off.

New Limits. BUPERS Instruction 6110.2A of 17 June 1976 sets strict

new weight limits that vary according to height, with no loopholes for age (see chart). The new top weights once applied only to aviation personnel, who had to be slim enough to work safely in the limited space of an aircraft, and hardy enough to withstand the stresses of flying.

For Navy women, the new maximum weights are those that once applied only to Navy women ages 18 to 20.

For men, top weights are way below the old maximums for men in any age group. Under standards issued in 1974, for instance, a 6-foot Navyman, 36-40 years old, could weigh as much as 224 lbs: he may now tip the scales at no more than 203 lbs, and even then may be considered overweight if he has too much fat and not enough muscle. (But it's possible to weigh more than the new standards and not be dubbed overweight if a large frame or well developed muscles account for the extra pounds.)

It's up to Navy medical officers to determine who's fat and who's fit. In support of the new weight program, Navy physicians will:

- Monitor and record weight and height during sick call and physical

examinations. "Most people gain weight slowly and don't see the pounds creeping up on them," says CAPT Frank M. Barnwell (MC), head of the Physical Standards Branch at the Bureau of Medicine and Surgery. "So when someone comes in with any complaint, even a sore throat, physicians will do him a favor by putting him on the scale."

- Examine obese and overweight men and women for disease or physical characteristics that may be aggravating their weight problem.

- Determine when a person is too fat to perform his duties properly.

- Alert the commanding officer to obese individuals in his command, suggest ways to help them, and inform the CO of their progress in losing weight.

Naval officers who stay flabby will see their lack of fitness recorded on their fitness reports. Enlisted men and women who don't take the weight program seriously may find they cannot reenlist—may even be discharged.

But slimming down is only part of the battle: the Navy wants its members to be fit as well as svelte. To help Navy members achieve top physical condition, the Chief of Naval Operations issued OPNAV Instruction 6110.1 on 16 June 1976 advocating an aerobics program.

The Navy has used aerobics for several years—but it's now getting new emphasis as the best, most flexible program for active-duty forces, especially at sea where space and equipment are limited. An aerobics exercise program can be undertaken with minimal props: a chart of aerobic points for various activities, a watch, and the determination to stick with it.

"The Exercist." The Naval Health Sciences Education and Training Command has prepared a new film on aerobics—"The Exercist." The film shows that in aerobics the idea is to increase the volume of oxygen the body can process by strengthening the lungs, heart and vascular system. Running, cycling, swimming and walking are some of the activities that do the job.

Navy Weight Standards (BUPERS Instruction 6110.2A of 17 June 1976)

Males			Females		
Height (inches)	Weight		Height (inches)	Weight	
	Minimum	Maximum		Minimum	Maximum
60	100	140	58	90	121
61	102	145	59	92	123
62	103	150	60	94	125
63	104	155	61	96	127
64	105	160	62	98	129
65	106	165	63	100	135
66	107	170	64	102	136
67	111	175	65	104	140
68	115	181	66	106	144
69	119	186	67	109	147
70	123	192	68	112	152
71	127	197	69	115	158
72	131	203	70	118	162
73	135	209	71	122	168
74	139	214	72	125	171
75	143	219			
76	147	225			
77	151	230			
78	153	235			



HM2 Engelbrecht, LT Sessions
Aerobics advocates

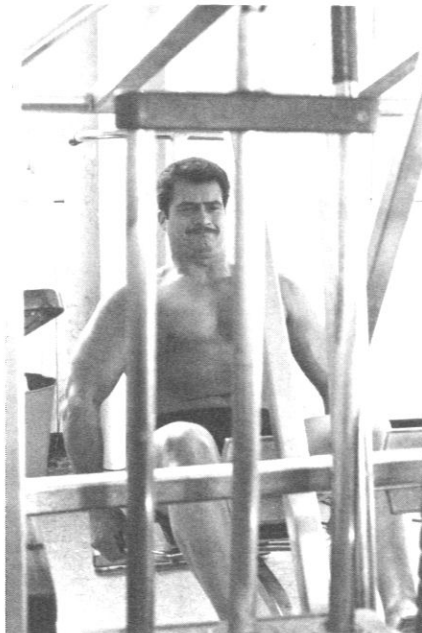
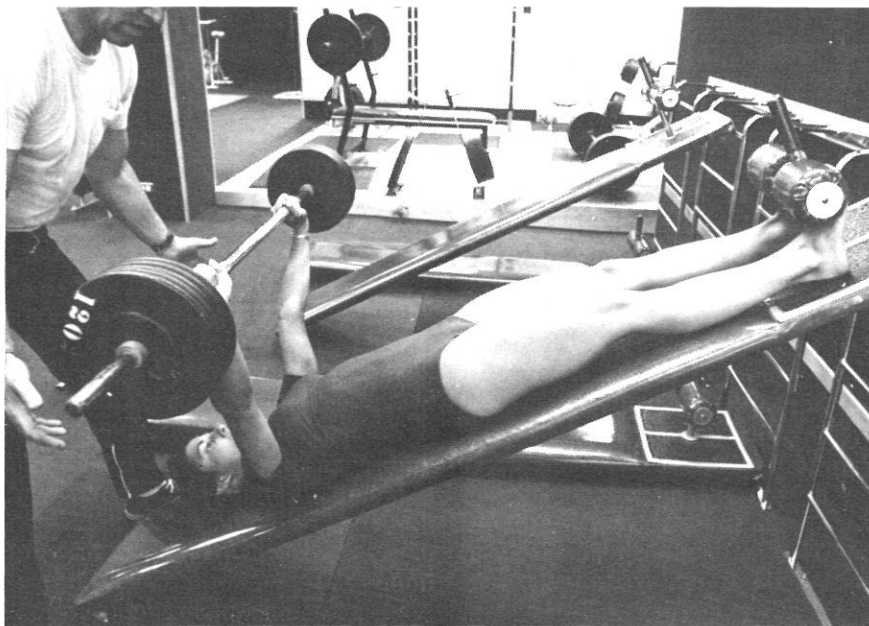
An aerobics program isn't difficult to follow, but it isn't easy street, either. "You can't sell it as a painless experience," says CAPT Strange. "The discomfort is part of it. The pain gets less, but you can't expect it to go away forever. The first mile is always awful, no matter how good shape you're in."

Here's how you can start your own aerobics program:

- If you're over 30 and haven't had a physical examination for the past six months, you should probably see a physician first. If you are overweight or have high blood pressure, diabetes, or heart or respiratory disease, a physical examination is a must.

- Start slow. Take two or three months to condition yourself, and gradually work up to 30 or more aerobic points a week. Taking it easy at first may not be difficult: "I was in such bad shape when I started that there was no possibility of overdoing it," says CAPT Joseph S. Cassells (MC) of BUMED's Education and Training Branch, who has been jogging for six years.

- Get the proper equipment. Says CAPT Strange: "I ended up buying



Here's how the Navy medical team shapes up: (clockwise from top) DT3 Read builds strength pressing weights; hospital corpsmen join marathon run from NRM Camp Lejeune to BUMED; LT Doppelheuer bicycles around Washington; body-builder HN Bucci works out on a universal gym.



expensive shoes. If you're running seriously, a good pair of shoes is essential."

- Warm up before you start strenuous exercise. Warmup exercises (described in the OPNAV instruction) stretch the muscles and increase your heart and breathing rate, preparing your body for greater stress.

- Vary your exercises to give different sets of muscles a workout.

- Wait at least an hour after you eat before exercising, to avoid painful stomach cramps.

- Put some oomph in your exercises. If you decide to walk, walk briskly. Anything less will not improve your cardiovascular system.

If you follow these suggestions and stick to your aerobics program, you may be surprised at the results. You have a good chance of avoiding high blood pressure, hypertension, and overweight, and you'll probably sleep better and have more energy, too. CAPT Cassells, who started jogging "to keep my sanity" when he quit smoking and went on a diet, even composes memos in his head while on the run. His worst problem, he says, is "fighting an overwhelming sense of smugness."

Medical Department joggers say that peace of mind accompanies physical fitness: "Exercise pulls you out of whatever morass you're in and gives you a different perspective," says CAPT Strange. "After running five miles, nothing seems as difficult as before."

While most of Navy medicine's joggers run for their own satisfaction, some are serious enough to run competitively. Perhaps the most unusual runner in Medical Department history is CAPT Paul Spangler, a 76-year-old retired Navy surgeon who has set world records for runners in his age group. The septagenarian track star, who didn't start running until age 67, expects to run in the 1977 World Master Tournament at Goteborg, Sweden.

Jogging seems to be the favored exercise at BUMED, but other Medical Department members use more exotic methods to stay in

shape. HN Jim Bucci, a student at the Naval School of Health Sciences in San Diego, is a body builder who works out on a contraption called a universal gym. No pastime for the weak of spirit, body building demands careful, planned use of weights and other equipment to control and develop all the body's muscles.

And if you think exercising is male turf, look again—at DT3 Diane Read of the Marine Corps Recruit Depot, San Diego. She weighs only 104 lbs, but the 21-year-old dental technician can press up to 120 lbs. She builds her strength by swim-

ming three times a week and working out with weights regularly. Then there's LT Sandra Doppelheuer (MSC, USNR-R), a dietitian at the Navy Food Service Systems Office, Washington, D.C., who runs, cycles to work, and serves as physical fitness officer for her Reserve unit.

Physical fitness promotes the feeling of well being, and allows people to feel good about themselves and their accomplishments. As Dr. Spangler told *U.S. Navy Medicine*: "The human body is a wonderful machine. It thrives on use."

Equal Opportunity—Phase II

"We're one of the first Navy shore commands to introduce our program to field activities," says LT Buddy L. Jones (MSC), the Surgeon General's special assistant for military equal opportunity. He's talking about the Navy's new "Phase II" equal opportunity education program.

The Bureau of Medicine and Surgery led the way for the Medical Department by completing the Phase II program at headquarters level earlier this year. Then two new detachments of equal opportunity program specialists—headed by CDR Daniel Machir (MSC) on the East Coast and LCDR Dimitri

AFFIRMATIVE ACTION PLAN HIGHLIGHTS

BUMED's military affirmative action plan (BUMED Instruction 5354.2 of 15 June 1976) supports the Navy's affirmative action plan, and backs up Phase II with concrete goals and specific steps to achieve them. Here are the highlights:

- Navy members who "actively oppose" the Equal Opportunity Program—for instance, a supervisor who won't let a woman do certain jobs just because she's female—will be counseled.
- Military justice actions will be reviewed for possible discrimination. When discrimination is suspected, the case will be investigated.
- A BUMED instruction will be issued emphasizing the Navy's formal procedures for investigating and resolving discrimination complaints.
- Annual performance reports will include an evaluation of the individual's support of the Equal Opportunity Program.
- Education and training programs will be enriched to give all personnel the chance to "raise their educational level to that of their competitive peer group."
- Achievements and contributions of minorities and women will be publicized in press releases and official publications.
- Expression of cultural and individual preferences "consistent with good order and military discipline" will be promoted.

Kalfas (MSC) on the West Coast—carried Phase II to the field; they're currently running Phase II programs at Naval Regional Medical Centers Charleston, S.C. and Oakland, Calif. Other Medical Department commands will soon get interim guidance and a schedule of Phase II field programs for 1977.

A unique feature of the BUMED program is that it encompasses civilian as well as military personnel. The civilian Phase II program is under the direction of John H. Donoghue, special assistant to the Surgeon General for equal employment opportunity.

Here's what to expect:

- A BUMED admiral or captain will introduce the program to all commands, with an equal opportunity detachment officer-in-charge and a civilian representative on hand to answer questions. A schedule will be set for implementing Phase II in each command.
- The heart of the program is a series of workshops on such topics as racism, women's role in the Navy, military and civilian rights and responsibilities, and cultural expression in the Navy. There's at least one workshop for everybody in the command.
- The first workshops will acquaint everyone with the issues. The command will then develop military and civilian affirmative action plans.
- A command information system will be set up to collect, store and analyze equal opportunity data. Commands will monitor effectiveness by looking at "equal opportunity indicators": for instance, the number of women or members of minority groups who are honored, commissioned, advanced, retained, punished and discharged.
- A command team will be trained to present future workshops. People with teaching ability and an interest in equal opportunity will be chosen for the team.

High priority. A BUMED representative will revisit the command 60 days after Phase II is completed, and annually after that, to check on

the command's progress and provide further assistance. Medical and dental inspectors general will also keep an eye on command equal opportunity programs, which are given high priority by the Chief of Naval Operations.

These Medical Department initiatives parallel Department of Defense and Navywide actions. On 3 June 1976 the Secretary of Defense signed a DOD directive emphasizing equal opportunity in the military. Also in June, the Chief of Naval Operations approved a Navy military affirmative action plan which advocates vigorous methods to ensure that all Navy members have an equal shot at the good life. For the first time, the Navy plan provides specific direction to second echelon commands on steps they should take to ensure equal opportunity.

According to CAPT Rolf W. Steyn (MC), head of BUMED's Human Goals Branch and a member of the CNO task force that devised the Navy affirmative action plan, Phase

II lacks the controversial confrontation techniques tried earlier in Phase I. "This new program focuses on people's actual behavior, without trying to manipulate their thoughts and feelings," CAPT Steyn told *U.S. Navy Medicine*. "Phase II is flexible enough to fit local situations. It's realistic and frank, and it doesn't adhere to the saccharine-sweet, do-good pseudosociology fashionable in certain circles, in which one can envision Nero and Attila the Hun reassuring each other, 'I'm OK, you're OK.'"

What does Phase II offer the average Medical Department member—the man or woman who's all for equal opportunity but doesn't want to spend time in workshops? "Our equal opportunity program can improve communication within the command, and give command members a better understanding of human relations," says LT Jones. "In this way, Phase II may save time and dollars lost on human relations problems that could and should have been prevented."

New Home on the (Edson) Range

There's something new on the horizon at Edson Range (California) Weapons Training Battalion—a shipshape medical and dental clinic that opened for business last March. Part of Naval Regional Medical Center Camp Pendleton, the

\$518,000 clinic houses pharmacy, laboratory, and X-ray services, and three dental operating rooms designed to support four-handed dentistry. Health care for Navy families in the area was formerly provided in a local community center.



Edson Range clinic

Research

NISAT-II Surfaces

Medical Department researchers and Navy volunteer divers shared the spotlight last June at Naval Submarine Medical Research Laboratory, Groton, Conn., as they completed NISAT-II—the second in a series of projects exploring the feasibility of switching inert gases in breathing mixtures during saturation dives.



NISAT-II volunteer uses pulmonary function testing tube

CDR Claude A. Harvey (MC) was coordinator, and CDR Douglas R. Knight (MC) medical team supervisor for NISAT (nitrogen saturation)-II. CAPT Raymond L. Sphar (MC), commanding officer of the laboratory, congratulated the three participating volunteer divers—LTJG Michael D. Hebert, HMCS (DV) John J. Canaday, and BU1 (DV) Raymond M. Olsen—as they “surfaced” after seven days’ confinement in the laboratory’s hyperbaric chamber.

An earlier effort, NISAT-I, conducted at the laboratory in March 1975, demonstrated that a breathing mixture of nitrogen and oxygen can be substituted for more costly helium and oxygen in saturation dives at depths shallower than 198

feet. NISAT-II is the first of several dives to study whether divers can switch from a nitrogen-oxygen breathing mixture to the less narcotic helium-oxygen blend without getting “the bends”—decompression sickness. The helium mixture would enable divers working above 200 feet to make excursion dives to lower depths. NISAT-II researchers also wanted to see if the helium mixture could be used to decompress a diver trapped in a submarine containing compressed air.

The NISAT-II volunteers breathed a mixture of nitrogen and oxygen during their first three days in the chamber, then switched to a helium-oxygen atmosphere for the final four days. This “isobaric” or

constant pressure change in the environment occurred at a pressure equal to 66 feet of sea water.

The phenomenon of isobaric gas mixing can be explained this way:

When a diver breathes a gas mixture containing nitrogen, his body tissues gradually increase their nitrogen content until they reach equilibrium with the gas. If helium is then substituted for nitrogen in the breathing mixture, the helium will enter the tissues as the nitrogen leaves. Light gases such as helium move in and out of tissue faster than heavier gases like nitrogen. Since the body is already saturated, the unequal rate at which the helium enters and nitrogen leaves could cause supersaturation and decompression sickness, even if

the diver never changes depth or pressure.

CDR Harvey said that more than 25 investigators from the laboratory, representing many scientific disciplines, conducted extensive physiological testing to verify the NISAT-II divers’ health, and the adequacy of their environment for habitation. Although the experimental data is still being evaluated, the three men have demonstrated the feasibility of switching inert gases at shallow depths, CDR Harvey said. The divers, who showed no ill effects from their long confinement or from the inert gas change, will be followed by laboratory personnel in a longitudinal health study.

Saturation diving is based on the concept that, at a fixed depth, body tissues rapidly become saturated with the breathing gas available. Once the body is saturated, the time required for safe decompression does not increase. Thus divers can live in a pressurized chamber for long periods without increasing the time required for decompression. In the NISAT dives, for example, tissue saturation was complete within 60 hours of the time the subjects entered the chamber; after that, the time required for safe decompression to the surface did not increase, regardless of how long the subjects stayed “underwater.”

The laboratory, which began biomedical diving research in the late 1950’s, will continue to evaluate mixtures of nitrogen and oxygen as the breathing gas for shallow and intermediate depth saturation dives. The studies are part of the Naval Medical Research and Development Command’s research program in submarine and diving medicine.

Shallow and intermediate depth saturation dives using nitrogen instead of helium will provide Navy divers, marine biologists, caisson workers, biologists, marine geologists and oceanographers with less costly means of diving exploration.

—*The Dolphin*, Naval Submarine Base, New London, Groton, Conn. 06340.

U.S. Navy Medicine

Back When

Old Man-of-War Men

Passed Assistant Surgeon C.U. Gravatt reports from the USS Yantic in 1876:

The necessity of exercising great care in the examination of men for enlistment is also a matter to which I invite attention. Its importance cannot fail to be impressed on the mind of any medical officer at sea. There is now always to be found on every ship a class known as "old man-of-war men." They are in truth old, and the man-of-war propensities are strongly displayed when one of these ancient mariners is requested to state his age. Changing his quid to the other side, and with a touch of his cap, he answers with praiseworthy nonchalance, "Thirty-five, sir," while the silvered locks, furrowed brow, and stiffened joints proclaim that only a few more sand-grains remain in the time-glass of his scriptural longevity. Some few of these men, it is true, retain vigor disproportionate to age, but for the sake of the few the majority should not be kept from where they belong, the Naval Asylum; or, if duty is to be given them at all, let it be at navy-yards or on receiving-ships, where the arduous services of ships in commission are not demanded.

There is yet another set, dolts, who are always in trouble on ship-board because of their ignorance of the duties expected of them, and their inability to learn, owing to the low order of their mental faculties. They enlist in the Navy because no employment can be obtained ashore. Others, again present the stamp of rascality so plainly on their faces that it, too, should be held a disqualifying cause, though not in the range of a strictly physical examination.

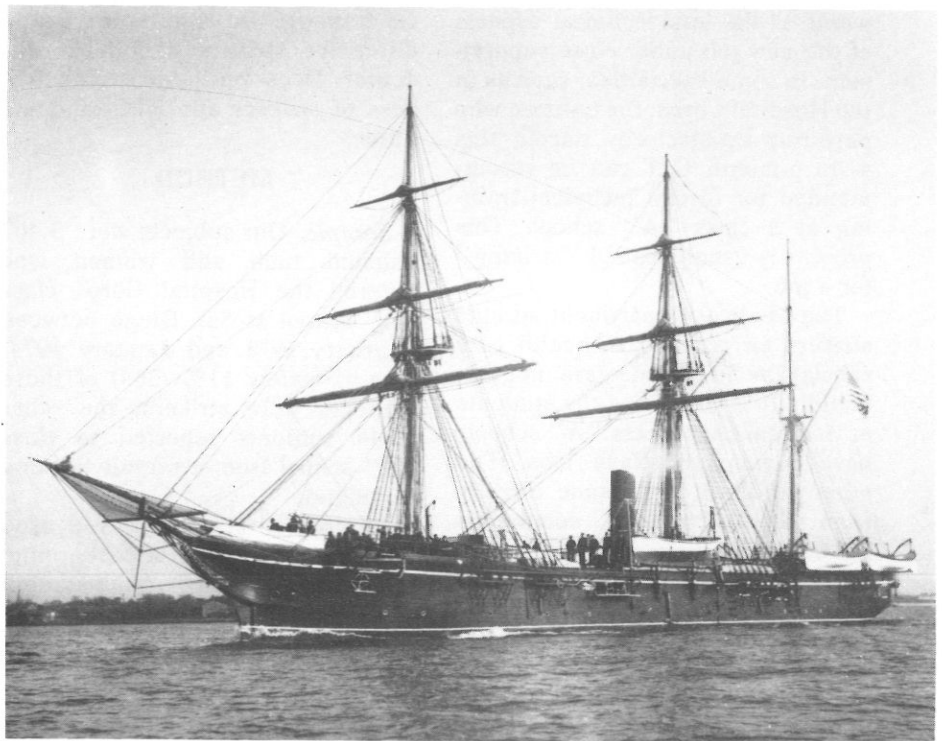
For the irregular enlistment on ships in commission a board of

three officers should be appointed, two of whom should be the executive and surgeon. They should examine the candidate on deck as to his ability to perform the duties pertaining to the grade he is intended to fill; gleanings from his former history should be obtained, and his *tout ensemble* taken in consideration. In many cases the surgeon could at once perceive physical disabilities, rendering further examination unnecessary; and disqualifying features that might escape the notice of one examiner might suggest themselves to another. This is the more important as, consequent upon the darkness, noise, and confined space on berth-decks, thorough and satisfactory physical examinations are impossible. Many

diseases and deformities escape detection in this way that, under better circumstances, would be apparent.

Regulation should forbid the permanent employment of men in the capacity of berth-deck cooks. Such men can almost always be singled out at a glance from the ship's company on account of their etiolated appearance, particularly on double-decked vessels. No one should be allowed to hold the office for a longer period than a month without change.

—*Hygienic and Medical Reports by Medical Officers of the U.S. Navy*, prepared for publication, under the direction of the Surgeon General of the Navy, by Joseph B. Parker, A.M., M.D., Surgeon, U.S. Navy. Washington: Government Printing Office, 1879, pp. 321-322.



In 1876, Navy medicine went to sea aboard the USS *Yantic*

Features

Are "Strikers" Good Candidates for Hospital Corps Training?

Richard F. Booth, M.S.
Michael S. McNally
CDR Newell H. Berry, MSC, USN

One of the major inducements to enlist in the Navy is the opportunity to receive technical training. Approximately 60% of Navy enlistees are assigned to technical training programs (class "A" schools) after recruit training; the rest are assigned to general duty, but have an opportunity to train in technical specialties while on the job. When there is an opening for such on-the-job training (OJT), the general duty enlistee can request a transfer to the new slot. If accepted, he or she works at the less technical aspects of the new job under close supervision. In some specialties, such as in the Hospital Corps, the enlistee who performs satisfactorily during this 4- to 6-month OJT can be recommended for formal technical training at a class "A" school. This process is usually called "striking" for a job.

The Medical Department accepts strikers for training in health care specialties. In recent years, approximately 10% to 15% of the students at Hospital Corps class "A" schools have come from Navy jobs. The other students have come directly from recruit training commands (RTCs). Although the practice of accepting strikers for formal techni-

cal training is well established, little is known about their characteristics and performance compared to RTC students.

This study was conducted to evaluate similarities and differences between strikers and RTC students who enter Navy paramedical training. We wanted to know: Do the aptitude, background, and personality characteristics of strikers and RTC students differ? Do strikers and RTC students differ in expectations and perceptions of paramedical training? Do results of training differ for strikers and RTC students? Does on-the-job effectiveness of strikers and RTC students differ?

METHOD

Sample. Our subjects were 3,407 enlisted men and women who entered the Hospital Corps class "A" school at San Diego between February 1973 and January 1974. Approximately 11% (363) of these students were strikers; the other 3,044 students reported to class "A" school from a recruit training command.

Descriptive measures. We used three questionnaires. A background information form asked the student for years of school completed before enlisting, number of suspensions or expulsions from school, satisfaction with school assignment, and reenlistment intentions. The Comrey Personality Scale (1) assessed the

student's self-reported characteristics on eight personality dimensions and two types of test-taking behavior. The Work Environment Scale (2,3) evaluated the student's perceptions of his occupational training environment. Two Work Environment Scales were used in this research: an *expectations* form which assessed what the student expected the occupational environment to be like, and an *actual* form which assessed the student's actual impression of the training environment. The same questions appear in both scales; only the verb tense differs.

All tests were administered at the start of "A" school training except the actual form of the Work Environment Scale, which was administered eight weeks later. General classification and arithmetic reasoning test scores were obtained from school records.

Outcome measures. School completion, final grade average, and survival for one year on the job were used as outcome measures. Student dropout figures and unweighted final grade averages were obtained from school records. To discover which students failed to complete one year on the job, we studied Bureau of Naval Personnel computer tapes, identifying men and women who had been discharged from the service for unsuitability, unfitness, or misconduct, or because of a court-martial, during the

The authors are research psychologists with the Naval Health Research Center, San Diego, California 92152. This study was supported by the Naval Medical Research and Development Command under research work unit MPN03.07-3011.

TABLE I. Means, Standard Deviations, and t-tests of Differences Between Strikers and RTC Students on Aptitude, Background, and Personality Variables

Variables	Strikers		RTC Students		t
	Mean	Standard Deviation	Mean	Standard Deviation	
Aptitude (GCT+ARI)	108.78	13.57	108.13	13.59	0.83
Background:					
Years of schooling	12.31	1.21	12.11	1.18	3.00*
Suspensions/expulsions	0.28	0.59	0.37	0.68	2.45*
Satisfaction	2.07	0.92	2.08	0.86	0.22
Reenlistment intention	2.19	0.96	2.38	0.83	4.04*
Personality:					
Trust	49.35	9.33	49.03	8.86	0.69
Order	57.42	9.27	57.08	9.39	0.63
Conformity	58.54	8.08	58.84	8.14	0.64
Activity	53.22	8.87	52.34	9.41	1.66
Emotional stability	51.75	9.21	51.36	9.23	0.76
Extroversion	52.99	11.21	52.30	11.19	1.10
Masculinity	50.73	10.51	50.22	9.98	0.91
Empathy	54.64	9.62	55.04	9.70	0.73
Validity	53.19	11.82	53.56	12.01	0.56
Response bias	58.50	11.77	58.76	11.77	0.39

*p < .05

TABLE II. Means, Standard Deviations, and t-tests of Differences Between Strikers and RTC Students on the Expectation and Actual WES Scales

Variables	Strikers		RTC Students		t
	Mean	Standard Deviation	Mean	Standard Deviation	
Expectation form:					
Work pressure	5.39	1.79	5.33	1.82	0.43
Innovation	3.69	2.49	4.17	2.63	2.65*
Physical comfort	3.07	1.76	3.63	1.71	4.77*
Control	5.23	0.98	4.95	1.24	3.37*
Communication	5.58	2.25	6.24	1.91	4.93*
Peer cohesion	4.06	1.65	4.58	1.43	5.16*
Task involvement	4.96	1.96	6.07	1.62	9.68*
Actual form:					
Work pressure	5.28	2.12	5.49	2.04	1.43
Innovation	2.17	2.02	2.41	2.28	1.51
Physical comfort	2.36	1.74	2.56	1.72	1.68
Control	4.31	1.56	4.57	1.40	2.66*
Communication	3.90	2.36	4.33	2.39	2.61*
Peer cohesion	3.60	1.78	4.06	1.61	4.15*
Task involvement	3.82	2.04	4.53	2.21	4.68*

*p < .05

year after training. Individuals discharged during this period without a recommendation for reenlistment were also considered to be nonsurvivors, regardless of the reason for discharge.

RESULTS

Demographic characteristics. We first sought to ascertain whether the aptitude, background, and personality characteristics of strikers and

RTC students differ. The mean, standard deviation, and t-test of the difference between means are shown in Table I for each variable. These figures indicate that strikers completed more years of schooling with fewer suspensions or expulsions than RTC students. Strikers also reported less frequently than RTC students that they intended to reenlist in the Navy. The level of satisfaction with school assignment, and the aptitude and personality

characteristics of strikers and RTC students were essentially the same.

Psychosocial perceptions. The second question we asked was whether expectations and actual perceptions of the occupational training environment differed for strikers and RTC students. The means and standard deviations for the expectation and actual forms of the Work Environment Scale are shown in Table II, with t-tests of the difference between means for strik-

ers and RTC students. These figures show significant differences in the expectations of the two groups on six of seven environmental dimensions. The strikers, more than the RTC students, expected the school staff to use rules and regulations to control students. The strikers expected the staff to make less effort to communicate with and understand the needs of students, and looked for less interpersonal involvement with other students and less student involvement in the task of becoming hospital corpsmen. Finally, strikers expected the physical environment to be less comfortable than did the RTC students.

There were also differences in the way strikers and RTC students actually perceived the occupational training environment, although these differences were not as dramatic as differences in expectations. Consistent with their more pessimistic expectations, strikers perceived less staff effort to communicate with and understand the needs of students, and less interpersonal and task involvement among students than did RTC students. Despite their expectations, however, strikers perceived less use of rules and regulations to control students.

When discrepancies between expectations and actual perceptions were compared for strikers and RTC students, significant differences were found on three of seven environmental dimensions (see Table III). The difference between expecta-

tations and actual perceptions was greater for strikers than for RTC students on use of rules and regulations in controlling students, but less for strikers than for RTC students on student involvement in training, and comfort of physical environment. These differences indicate that strikers are less disappointed than RTC students with their paramedical training.

Outcomes. Our last goal was to determine whether strikers differ from RTC students on outcome measures, both in training and on the job. Some 89% of the strikers completed school, compared with 76% of the RTC students—a significant difference ($t=7.16$, $p<.001$). The final grade average of students who graduated from training was 86, slightly although significantly ($t=2.18$, $p<.05$) higher than the average of 85.1 obtained by RTC students. Once on the job, the one-year survival rate for strikers was 97%, slightly higher than the 94% rate achieved by RTC students. This difference was also statistically significant ($t=3.02$, $p<.01$).

DISCUSSION

These results indicate that strikers are better candidates for paramedical training than students from recruit training commands, and suggest that the Navy should rely more on strikers as a source of students for class "A" schools.

Why were the strikers, who were as qualified for paramedical train-

ing as RTC students, not assigned previously to class "A" school training? One possibility is that all class "A" school quotas were filled when the strikers enlisted. Or, many of these individuals could have requested general duties when they entered the Navy, and after working for a period of time, could have seen that Navy training was one way to develop vocational skills. This latter possibility is consistent with the results of Hoehn, Wilson and Richards (4), and Johnston and Bachman (5), who found that the vocational plans of young men and women entering the military service are often vague. For some of these individuals, the military is an opportunity to think things through while they are exposed to a variety of occupations. Whatever their reasons for missing their first opportunity to get technical training, these men and women clearly took advantage of their second chance. Our findings suggest that the prior working experiences of strikers encourage the development of vocational maturity and motivation to do the job and perform successfully in school. The results also suggest the value of having recruits work before they undertake occupational training.

The less favorable expectations and actual perceptions of strikers may be a result of their previous work experiences in the Navy. RTC students report for "A" school training from the highly structured environment of recruit training. In contrast, strikers are likely to report for training from a work environment, where they have observed interpersonal and organizational relationships more typical of Navy life. Consequently, with a broader perspective than RTC students, and with previous experience with graduates of paramedical training, strikers are more likely to be realistic about the class "A" school environment. This hypothesis is supported by our finding that there were fewer discrepancies between what strikers expected and actually found in training.

One argument against greater

TABLE III. Means, Standard Deviations, and t-tests of Differences Between Strikers and RTC Students on the Discrepancies Between Expectation and Actual WES Scale Scores

WES Scale	Strikers		RTC Students		t
	Mean	Standard Deviation	Mean	Standard Deviation	
Work pressure	0.10	2.24	-0.16	2.18	1.66
Innovation	1.53	2.31	1.76	2.31	1.30
Physical comfort	0.71	2.00	1.07	1.92	2.73*
Control	0.93	1.66	0.38	1.58	4.96*
Communication	1.68	2.28	1.92	2.35	1.44
Peer cohesion	0.46	1.73	0.51	1.69	0.45
Task involvement	1.14	2.05	1.54	2.05	2.85*

* $p < .05$

use of strikers in paramedical specialties is that they have less obligated time after completion of training. But strikers, by reporting less often that they intend to reenlist, may have been making a more realistic assessment of their intentions than the less experienced RTC students. If strikers actually reenlist more frequently than RTC students, the career personnel gain might offset the argument about less obligated time. We plan to study reenlistment rates for the two groups.

This study focused on the training performance and one-year survival of strikers compared with RTC students. But better indices of on-the-job performance are needed: survival is necessary but not sufficient to perform effectively as a corpsman. We must also assess how well strikers and RTC students perform. New performance evaluation scales are being developed and will be used in future studies.

Overall, we found that strikers were better students than people drawn directly from RTCs. Although the strikers were more critical of paramedical training than RTC students, they also had fewer disappointments in training. Training and on-the-job outcomes can probably be improved with an administrative policy of accepting all qualified strikers before filling school quotas with RTC students.

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Scholars' Scuttlebutt

How To Be Heard

An interesting sidelight of the controversy surrounding the taxation of federal medical scholarship subsidies is that scholarship students are learning to get their concerns aired in the appropriate forums.

The Bureau of Medicine and Surgery, the Surgeons General of the Armed Forces, and the Department of Defense have voiced their concern over the tax problem, and will continue to do so. But the larger question of how *you* as an individual may influence federal and civilian organizations deserves further attention.

For matters that affect Medical Department officers, an element of strategy must be employed. The actions of both federal and nonfederal organizations have direct impact on your activities as a health care professional and a military officer. To effectively voice your agreement or disagreement with their policies, procedures or legislation, you must first decide whether you should act as an individual or as a member of a group.

If you decide on an individual action, direct communication, by letter or telephone, with the organization involved is generally sufficient to gain access, especially in matters of purely personal concern. But for collective efforts to succeed, they must be directed to the most appropriate arena.

In the military arena, collective concern on the part of Medical Department officers must be expressed formally through the Bureau of Medicine and Surgery. In this regard, the Surgeon General is your official and most effective spokesman, outside the Navy Department as well as within.

One of the professional arenas outside the Navy Department is the American Medical Association, to which the Surgeon General is a delegate. Official positions of the AMA are issued by the House of Delegates in annual convention. Your access to the House is through the Surgeon General, or through the AMA Federal and Military Section, House Officer/Intern/Resident Section, or Student Business Section. Each of these agents may formulate resolutions and present them to the House of Delegates for consideration. In addition, the Association of Section and Service Delegates provides an informal forum for the exchange of ideas and information.

During the June 1976 convention, resolutions were introduced on behalf of the members and passed by the House of Delegates supporting graduate medical education in the Armed Forces, permanent tax relief for Armed Forces Health Professions Scholarship Program participants, and variable incentive pay legislation. Although these resolutions have no legal status, the resolved support of organized medicine strongly influences public opinion, and the opinions and enactments of legislative bodies. It is through such resolutions that your concerns and opinions may be communicated and your collective influences used to greatest advantage.

In future issues of *U.S. Navy Medicine* we will discuss other ways you can make the system work for you.

Making His Mark

LT Bart Chernow (MC) was the top graduate of the Downstate Medical Center College of Medicine in New York City last May. He not only graduated summa cum laude, but also won four awards for academic achievements: the Mitchell Prize, the 1976 Award of the Brooklyn Society of Internal Medicine, the Mosby Book Award, and the Lange Book Award. LT Chernow is interning at the National Naval Medical Center, Bethesda, Md.

Policy

Instructions and Directives

Revised tuberculin testing and reporting requirements

Personnel entering the regular Navy, Naval Reserve, Marine Corps or Marine Reserve for more than 30 days' duty, including duty for training, shall be tested for tuberculosis by the Mantoux method using intermediate strength, stabilized, purified protein derivative (PPD) of tuberculin (5 tuberculin units equivalent). First and second strength PPDs are no longer used. Testing and interpreting shall be done by trained Medical Department personnel. (Proper techniques are briefly described in this change to MANMED.) Results are to be entered in the individual's health record on Standard Form 601 and reported to BUMED annually. Complete details on the tuberculosis control program are in BUMED Instruction 6224.1D.—Change 88 to the *Manual of the Medical Department*, 15-91(1), (2b), (3)(a)(b)(c), deletes 15-91(4), 14 April 1976.

Handling health records of Navy members in foreign hospitals

When a Navy member is hospitalized in a foreign medical facility, his health record shall be retained on board until the patient returns to duty or is transferred to another Navy vessel or U.S. military activity. If the member is still hospitalized when his ship leaves port, his health and service records and a complete history of his case shall be forwarded to the nearest U.S. embassy or consul. When the patient recovers, the embassy or consul shall arrange for his transportation, with records, to the nearest U.S. naval activity.—Change 88 to the *Manual of the Medical Department*, 16-25(1), 14 April 1976.

Contact lenses for class 1, group 1 and class 2 personnel

Class 1 personnel may not wear contact lenses while performing flight duties. For class 2 personnel, optional contact lenses are authorized when procured at the wearer's expense to correct visual acuity; the person must be accustomed to wearing lenses, vision must be adequately corrected, and the flight surgeon must authorize use of the lenses on NAVMED 6410/2, Clearance Notice (Aero-Medical). Contact lens wearers must carry at least one pair of corrective spectacles. Wearing contact lenses to change the corneal curvature is prohibited.—Change 88 to the *Manual of the Medical Department*, 15-62(11)(d) and 15-69(1)(b), 14 April 1976.

Handling lost, damaged or destroyed health records

When a health record is lost or destroyed, the custodian shall prepare a replacement record; BUMED Code 742 need not be notified. If a health record is duplicated—because of illegibility or deterioration, for example—the original shall be placed in a plain envelope and made a permanent part of the record. On the front of this envelope, the custodian shall record the member's full name and other identifying data, and list the original records enclosed. Health records of military members who cannot be located shall be forwarded to BUMED Code 7424 with an explanatory letter of transmittal.—Change 88 to the *Manual of the Medical Department*, 16-27(1)(2)(3), 14 April 1976.

Service obligation for dental officer training

This instruction revises service obligations some dental officers incur by obtaining postgraduate training while on active duty. General practice residents in dentistry will not incur an additional obligation; their minimum initial service obligation remains three years. For dental officers in training before 30 June 1976, the period of obligated service for Navy residency, graduate, or postgraduate training shall be reduced by the amount of time they served as active-duty military officers in unobligated status before they began Navy-sponsored training; however, the remaining obligation must be at least one year. A dental officer's obligated service for Navy training programs that began on or after 1 July 1976, and for civilian residency, graduate, or postgraduate training may *not* be reduced because of previous unobligated active-duty military service.

Armed Forces Health Professions Scholarship Program students do not incur an additional service obligation when they obtain initial general practice residencies in dentistry or residency training before satisfying an active-duty obligation incurred under the Program. However, this period of time spent in training is *not* creditable toward satisfying an active-duty obligation imposed under the Program.

Armed Forces Health Professions Scholarship students do not incur an additional service obligation when they obtain internship or residency training; they must still satisfy active-duty obligations incurred under the scholarship program.

Dental Corps officers who were in the same Navy or civilian training program before and after 1 July 1970

shall have their obligated service recomputed in line with paragraph 3(b) of this instruction.

Other service obligations have not changed from the previous policy.—BUMED Instruction 1520.18A of 2 June 1976.

Radiation health training for MC and MSC officers

Supervisory medical personnel on ships and stations that support nuclear powered ships must attend a two-week course in radiation health at the Naval Nuclear Power Training Unit, Ballston Spa, N.Y. BUMED Code 53 will recommend quarterly class convening dates to the Energy Research and Development Administration, which conducts the course, and will assign officers to each session. Submarine medical and radiation health officers will attend this course as temporary additional duty en route from the Naval Undersea Medical Institute to their billet; medical and radiation health officers who have not completed this training and who are assigned to a billet listed in this instruction will be ordered to the course as temporary duty en route to their new assignment. Officers in the specified billets who have not had radiation health training and who have at least one more year in their tour will attend the course as soon as possible.—BUMED Instruction 6470.15 of 8 June 1976.

New reporting procedures for dental officer continuing education

Procedures have been revised for reporting dental officer continuing education training. Commanding officers of BUMED-commanded dental facilities, and senior dental officers of non-BUMED-commanded dental facilities shall report by the 10th of each month all two-day or longer continuing education courses and conferences attended by dental officers during the previous month. Reports shall be sent to the Naval Health Sciences Education and Training Command (Code 5), National Naval Medical Center, Bethesda, Maryland 20014, with a copy to BUMED Code 6112. Negative reports are required.—BUMED Instruction 1520.20, Change Transmittal 1 of 12 May 1976.

New names for branch medical facilities

Naval branch medical facilities should comply with SECNAV Instruction 6320.19 of 19 April 1976, which designates fixed medical treatment facilities as medical centers, hospitals, or clinics. A list of Navy medical facilities is included in enclosure (1) of BUMED Notice 6320 of 21 May 1976. Requests to change any designation should be sent to BUMED Code 72.

Clinics (formerly dispensaries) will no longer admit patients or maintain operating beds for inpatient care, although holding beds are permitted to observe patients. BUMED will issue revised bed authorization letters.—BUMED Notice 6320 of 21 May 1976.

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Notes & Announcements

DENTAL CONTINUING EDUCATION COURSES OFFERED

These dental continuing education courses will be offered in October and November 1976:

National Naval Dental Center, Bethesda, Md.

Oral Diagnosis and Treatment Planning	18-20 Oct 1976
Oral Surgery	1-3 Nov 1976

Eleventh Naval District, San Diego, Calif.

Oral Diagnosis	4-6 Oct 1976
Fixed Partial Dentures	18-20 Oct 1976
Operative Dentistry	1-3 Nov 1976

U.S. Army Institute of Dental Research, Walter Reed Army Medical Center, Washington, D.C.

Preventive Dentistry	18-21 Oct 1976
Prosthodontics	1-4 Nov 1976

Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D.C.

Forensic Dentistry	4-7 Oct 1976
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Applications for courses administered by the Eleventh Naval District should be sent to the Commandant, Eleventh Naval District (Code 37). Submit applications for all other courses to the Commanding Officer, Health Sciences Education and Training Command (Code 5), National Naval Medical Center, Bethesda, Md. 20014, in time to arrive six weeks before the course begins. Cross-country travel and travel from outside the continental U.S. for dental continuing education courses and professional conferences will usually not be approved due to limited funding.

AFIP SETS TRAINING IN OTOLARYNGIC PATHOLOGY, FORENSIC DENTISTRY

The Armed Forces Institute of Pathology (AFIP), Washington, D.C. has announced these training sessions:

- An otolaryngic pathology course, covering temporal bone pathology and surgical pathology of the head and neck. Requirements for admission are flexible, but preference is given to residents and practitioners in otolaryngology and pathology who want to learn more about ear, nose and throat pathology. The free course is given quarterly starting each January, April, July and

October; it lasts three months, but physicians seeking shorter training will be considered.

- A pediatric otolaryngic pathology seminar, covering embryology, congenital disease, and inflammatory and neoplastic pathology of the pediatric otolaryngic area. This seminar meets 6-8 December 1976.

- The 13th annual forensic dentistry course to be held 4-7 October 1976. Subjects to be covered include bite marks, recent advances in identification, dental identification in mass disasters, and the relationship between forensic dentistry and the Federal Bureau of Investigation. Lab sessions will train participants to identify human remains by examining dental records. Also featured is a mock trial depicting the dentist's role as expert witness and defendant.

To apply for these courses, write to the Director, Armed Forces Institute of Pathology, Attention: AFIP-EDZ, Washington, D.C. 20306.

85 GRADUATE FROM MEDICAL SERVICE CORPS ORIENTATION

Eighty-five new Medical Service Corps officers, representing 18 different specialties, graduated from the Naval School of Health Care Administration in July—the largest orientation class in MSC history. Among the graduates were 8 officers with Ph.D. degrees and 67 officers with master's degrees or equivalent education.

Addressing the graduates, CAPT William E. McConville, director of the MSC Division at the Bureau of Medicine and Surgery, said that the high quality of the orientees is typical of today's applicants for the Corps, and estimated that for each accession there are at least five qualified applicants.

NAMRU 5 SPONSORS MEDICAL RESIDENTS FOR RESEARCH IN ETHIOPIA

Every year, four medical residents from Case Western Reserve University, Cleveland, Ohio, spend three months investigating infectious diseases in Addis Ababa, Ethiopia, in a project conducted jointly by Naval Medical Research Unit No. 5 and Case Western Reserve's Department of Medicine. Developed by CAPT Craig K. Wallace (MC), commanding officer of NAMRU 5, and Charles C.J. Carpenter, M.D., chairman of medicine at Case Western Reserve, the program gives junior or senior assistant residents interested in international medicine or infectious disease research the chance to work in a tropical hospital, participate in ongoing research projects, or do their own research. The residents are based at the NAMRU 5 clinical research ward in St. Paul's Hospital, Addis Ababa, where they participate in clinical and laboratory field work, teach, and care for patients.

NAVY COCKTAIL PARTY SET FOR AMERICAN COLLEGE OF SURGEONS MEETING

The Navy cocktail party, held each year at the American College of Surgeons annual meeting, will take place on 13 October, from 1800 to 2000, in the Upper Summit Room of the Conrad Hilton Hotel, Chicago, Ill. For further information, contact CAPT William J. Storz (MC), Chief of Surgery, Naval Regional Medical Center, Great Lakes, Ill. 60088.

MILITARY SURGEONS ASSOCIATION TO MEET

"Spirit of Federal Medical Support for 1976" is the theme of the 83rd annual meeting of the Association of Military Surgeons of the United States, to be held 31 Oct to 4 Nov 1976 at the Convention Center, San Antonio, Tex. More than 75 papers will be presented. A film program is also scheduled.

General chairman for the meeting is BG Howard R. Unger, USAF, MC; COL Robert G. McIver, USAF, MC, is co-chairman, and BG Ernest J. Clark, USAF, MC is program chairman.

NAVY RESEARCHER DEVELOPS MOSQUITO CONTROL METHOD

A Navy Research Laboratory civilian, William D. Garrett, has developed a new technique for controlling the breeding of mosquitoes. Small amounts of certain clear, organic liquids are applied to standing bodies of water where mosquitoes breed. The liquid film, only one molecule thick, reduces the surface tension of the water; unable to attach themselves to the surface, the larvae sink and drown. Adult mosquitoes also drown when the calm surface interferes with their breathing.

Now being tested, the technique uses far less fluid than other pest control methods. Preliminary studies show that the liquid film does not harm underwater marine life or cause oxygen starvation in animals besides mosquitoes. The technique could be important because the use of DDT has been prohibited in the U.S., and the use of other pesticides greatly curtailed.

PATIENT IDENTIFICATION POSTER DESIGNED

Armed Forces identification cards, and a summary of the bearer's entitlement to health benefits are clearly displayed on a newly designed poster (see page 15) which Medical Department treatment facilities may find useful. This ready reference chart can help new staff members determine a patient's eligibility for inpatient and outpatient care.

Medical Department facilities may wish to make their own posters, following this pattern, for display in areas used by patients and staff.

REQUIRED IDENTIFICATION FOR MEDICAL CARE

	ADMISSION	OUTPATIENT CARE
ACTIVE	YES	YES
DEPENDENT	<div style="text-align: center; vertical-align: middle;">YES</div> <p><i>NOTE:</i> This card is also issued to people who are not dependents. The reverse side of the card must be checked to see that the positive entry 'YES' is entered in appropriate blanks. Children 10 yrs and older must have I.D. card.</p>	YES
RETIRED	YES	YES
RESERVE	NO	NO

NOTE: Other types of I.D. cards may be presented. The Patient Affairs Officer or the Administrative Watch Officer shall determine the eligibility of the bearer before treatment is provided.

ALL PERSONS PRESENTING THEMSELVES FOR TREATMENT MUST SHOW A VALID I.D. CARD. THESE CARDS SHALL BE THOROUGHLY CHECKED FOR EXPIRATION DATE AND OTHER ELIGIBILITY INFORMATION.

WANTED: AVIATION MEDICINE MEMORABILIA

If you're a flight surgeon, you might have memorabilia stashed away that would interest the Aerospace Medical Association. The Association is compiling a directory of important historical material related to aviation medicine—items such as diaries, photographs, and medical equipment. Says the Association's former president, J. Harold Brown, M.D.: "Many important aviation medical artifacts are probably lost in obscure exhibits and private collections. We'd like to know their whereabouts." Send information about such items to the Aerospace Medical Association, Washington National Airport, Washington, D.C. 20001.

FRUGAL MSC OFFICER WINS PRESIDENTIAL CITATION

The U.S. Government has saved \$109,000 and expects to save even more, thanks to some clever chemistry by LT Thomas E. Gran (MSC), head of the Drug Screening Laboratory at Naval Regional Medical Center Great Lakes, Ill. LT Gran received citations from President Ford and the Surgeon General for his idea.

In conjunction with Naval Regional Medical Center San Diego, Calif., LT Gran and his staff found that the reagent for radioimmunoassay could be diluted with 0.01m phosphate buffer in normal saline at pH-7.0 with minimal loss of activity. The reagent previously was used full strength, as the manufacturer suggests.

The savings in reagent brought about by this technique have helped lower operating costs at NRMC Great Lakes and NRMC San Diego. The technique is being considered at other Navy drug screening labs.

The Surgeon General cited LT Gran for his "uncommon initiative, ingenuity, logic and loyalty in devising and implementing a clever modification in chemical analysis . . . while maintaining the customary high standards of efficiency and quality traditional in the Medical Service Corps." The Presidential citation praised LT Gran for improving government operations and setting an outstanding example for federal employees.

TABLE CLINICS PRESENTED AT DENTAL ALUMNI MEETING

Staff members and residents of the Dental Service, Naval Regional Medical Center, Oakland, Calif. presented four table clinics at the 1976 University of California School of Dentistry Alumni Association meeting this spring.

The clinics covered corticotomies and unitooth osteotomies, endodontic replants, endodontic aids, and tooth splinting. Unitooth and segmental osteotomies, it was shown, are practical techniques for correcting dento-alveolar deformities in outpatients. For nonvital

posterior teeth, replantation procedures were suggested; different endodontic fillings and favored equipment and methods were demonstrated. Advanced splinting techniques were demonstrated as adjunctive and interim therapy for a mobile dentition secondary to periodontal disease.

The four-hour clinics included case presentations, and detailed analyses of preoperative patient evaluation and surgical procedures.

GRATUITY BAN APPLIES TO ALL PERSONNEL

Conflict-of-interest prohibitions against accepting gifts from defense contractors apply to everyone in the military, including junior and noncommissioned officers. Under these rules, military personnel may not accept such gratuities as free lunches and golf games from private companies doing work under contract for the Department of Defense.

Deputy Secretary of Defense William P. Clements, Jr., said in a recent interview that a military member "just has to hold himself above that sort of thing and not subject himself to criticism by taking gratuities, a Christmas present, lunches and dinners, or a golf game." He added: "Pick a duck-hunting friend who doesn't work for a defense contractor."

NRMC GREAT LAKES OPENS BRANCH CLINIC

Naval Regional Medical Center Great Lakes, Ill., opened its new branch clinic at the Naval Training Center, Great Lakes on 21 May 1976. Under construction since 1974, the facility provides more than 31,000 square feet for medical clinics, some 20,000 square feet for dental activities, parking spaces for 137 automobiles, and a garage for four ambulances. The new building cost about \$4.3 million.



Branch Clinic, Naval Training Center, Great Lakes

U.S. Navy Medicine

NAVMED Newsmakers



Jackson and friends: Scooping



Pund (left) and Cheek: Snipping

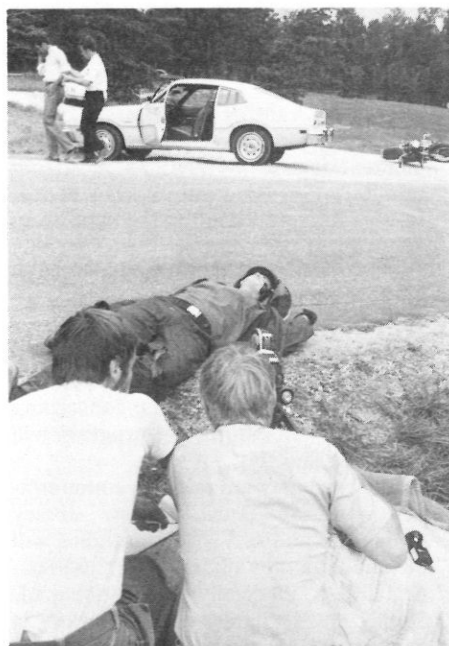


Niemann: Lifetime friend

They don't call him Scoop for nothing, as Sen. Henry M. "Scoop" Jackson of Washington proved at the July groundbreaking for the new Naval Regional Medical Center, Bremerton, Wash. Bad weather forced the ceremony indoors, where Sen. Jackson hit the dirt with, among other Navy and civilian dignitaries, RADM **Henry A. Sparks** (MC) and CAPT **Harold P. Pariser** (MC).

Meanwhile, across the country, CAPT **Harry C. Pund, Jr.** (DC) and CAPT Glen R. Cheek were not to be outdone by the Bremerton bunch: they used an oversized pair of silver-painted forceps to snip ground for the future Naval Regional Dental Center, Orlando, Fla. CAPT Pund will take command of the dental center; CAPT Cheek is commanding officer of Naval Training Center, Orlando.

Movie stars don't spend all their time lounging on the Riviera: stardom is often just plain hard work, as several thespian-corpsmen at Naval Air Station Patuxent River, Md. can tell you. Among Pax River medical personnel lending their talents to "First Aid for All Hands," a film slated for Navywide distribution later this year, are HM2s **Gary McCloud** and **Mike Thompson**. HM2 McCloud portrays a motorcyclist who collides with a car; HM2 Thompson stars as a sailor who passes the accident



Pax River stars

and leads the driver away for some expert first aid. Also in the cast: HM2 **Mike Arau** and HN **Tom Broady**, playing two ambulance attendants, and HM3 **William R. Houchin**, as a hiker.

Accepting her 37-year volunteer service award from the distinguished-looking admiral, Mrs. Gladys Niemann wondered, "Haven't I seen him someplace before?" She certainly had—she was a nurse on the obstetrics ward of the Woodland, Calif. hospital where RADM **Henry A. Sparks** (MC) was born. "I knew her when I was two minutes old," joked NRMC Oakland's commanding officer as he honored the long-time Red Cross volunteer.

When Typhoon Didang struck the Philippines last May, Navy medicine was ready: LCDRs **Scott Tidball** (MC) and **Michael Patterson** (DC), HM2 **Edgar Perez**, HM3 **Richard Carver**, and DN **Andy Manrique** set up an impromptu medical and dental clinic in the elementary school of a small barrio near Tarlac in central Luzon. When it was all over, 585 people had received medical treatment, and 64 had gotten dental care—no mean feat, considering only one dental chair was available. The Navy team made their patients feel at ease with a sign that read: "It is nice to be important, but it is more important to be nice."

BUMED SITREP

INFLUENZA IMMUNIZATION . . . The medicolegal questions that delayed implementation of the National Influenza Immunization Program of 1976 appear to have been resolved by the signing on 12 August of Public Law 94-380. Vaccines for civilian and military beneficiaries of the Department of Defense are being obtained, after resolution of procurement questions and legal concerns. A Bureau of Medicine and Surgery notice (6220 series) concerning the 1976-77 immunization program will be issued shortly.

As previously announced, immunization with influenza A/New Jersey (swine flu) and A/Victoria antigens will be mandatory for all active-duty personnel unless medically contraindicated. Some groups will also require influenza B vaccine. Civilian and dependent beneficiaries will be immunized on a voluntary basis.

Immunizations are expected to begin soon after vaccines are received by local commands, probably in mid to late September or early October.

DISPOSITION OF RECORDS . . . BUMED recently completed transferring the health and dental records of inactive Naval Reservists to the Naval Reserve Personnel Center, New Orleans, La. The records of *drilling* Reservists have been forwarded to their commands. This action completes Phase II of the Master Medical Record Concept, as it pertains to U.S. Navy and Naval Reserve members.

Change 88 to the *Manual of the Medical Department* and enclosure (1) to BUPERS Note 1070 of 21 June 1976 provide specific instructions for disposing of health and dental records when Navy members separate from active duty. Closed-out health and dental records will be delivered to the member's commanding officer for inclusion in and forwarding with the individual's service record. All Medical Department personnel involved with maintaining and servicing health and dental records should become familiar with the new procedures, and should develop close liaison with appropriate line authorities to ensure proper disposition of such records.

Change 88 to the *Manual of the Medical Department* relieves BUMED of the responsibility for maintaining at head-

quarters level the health and dental records of former Navy members. But it does not change the provisions of MANMED Article 16-18, which defines the responsibility for custody of records at field level. While a member is on active duty, his or her health and dental records will be retained by the Medical Department, as has been the traditional policy.

Change 88 does not affect disposition of records of Marine Corps personnel who are separated from active duty. Those records will continue to be forwarded to BUMED.

AUDIT TIPS . . . Medical Department commands scheduled for an audit should review the following management areas:

- Activities should comply with collection and write-off procedures for accounts receivable set forth in the *Financial Management Handbook* (NAVMED P-5020). Accounts receivable that are more than six months old should be reviewed for write-off. Debts that the commanding officer deems not collectible may be written off if less than \$100, or forwarded to BUMED for collection if more than \$100.

- Used polystyrene packing material should not be discarded. Naval supply centers and shipping activities save money by reusing this material, and will often pick it up from Medical Department activities. Check with the nearest supply center or shipping activity to determine whether your polystyrene packing material can be reused. In this effort, Medical Department activities should not incur any costs that are not reimbursable.

- Charge the cost of food given to blood donors against operating funds. These provisions should *not* be charged against ration allowances.

TRAINING RECOGNIZED . . . The Navy's ophthalmic laboratory training program recently became the fifth such program in the U.S. to be recognized by the National Academy of Opticianry. Students at the Naval Ophthalmic Support and Training Facility, Yorktown, Va., study optical theory, and learn to process lenses and fabricate spectacles. Graduates are assigned to the naval ophthalmic laboratory at Yorktown, and to ophthalmic service units worldwide.

COWART HEADS AFIP . . . The next director of the Armed Forces Institute of Pathology will be a Navy physician: CAPT Elgin C. Cowart, Jr., AFIP deputy director since October 1975. He will succeed COL James L. Hansen, MC, USA, on 1 Oct 1976.

AFIP figures in CAPT Cowart's past as well as his future: he was curator of the AFIP medical museum from 1964 to 1969.

LOOKING GOOD . . . Provisional academic accreditation has been granted the Uniformed Services University of the Health Sciences, allowing it to enroll its first students this fall. Classes convene 15 Nov 1976 at the Armed Forces Institute of Pathology, Washington, D.C. The school will move to permanent facilities at NNMCMC by September 1977.

IMMUNIZATION ACTION MONTH

. . . October is Immunization Action Month, and while the National Influenza Immunization Program is in the preventive medicine spotlight, an opportunity exists for Medical Department personnel to review and update their patients' immunization status.

It is particularly important for parents to review their children's immunizations. According to a recent editorial in the *American Academy of Pediatrics Newsletter*, 40,000 cases of measles (rubeola) are expected to occur in the U.S. during 1976, even though measles is preventable. In 1975 more than one-third of U.S. children one to four years of age were inadequately immunized against poliomyelitis; in 1964, by way of comparison, 79% of children in that age group had received three or more doses of live oral polio virus vaccine. A recent study showed that 40% of children entering U.S. schools had received less than four doses of diphtheria-pertussis-tetanus vaccine; barely one-third were protected against rubella, and only half were immunized against mumps.

Navy health care professionals have the scientific knowledge and skills to prevent disease. We also have the responsibility to involve our patients, our communities, and our entire Navy in effective immunization programs.

Support Immunization Action Month in October. Support immunization as a professional obligation all year round!

On Duty

Surgeon, Veterinarian, Other Specialties as Needed

At 8:05 a.m., the sun was already blazing high in the brilliant blue sky. Colors had just been held at the U.S. Naval Communications Station at San Miguel, 100 miles northwest of Manila, Republic of the Philippines. LCDR John S. Tidball (MC) walked briskly toward the branch clinic. As he passed two five-year-olds who were playing on the sidewalk, a small, shrill voice rang out, "Hey, that's my doctor."

LCDR Tidball, senior medical officer at the U.S. Naval Communications Station clinic, is the only Navy physician in San Miguel. He and his assistant, Dr. H.D. Jarin, a Filipino physician, care for some 3,000 people.

"This position is ideal," says Dr. Tidball. "I treat people of all ages—active-duty military and their dependents, plus quite a few retired military people and their families. In large hospitals, many physicians don't see such a variety of patients because there are so many separate specialty clinics."

"When I was in medical school," he remembers, "we talked a lot about country medicine, but we didn't really believe that it works. Well, I've learned a lot about the effectiveness of country medicine since I've been here, and I think all physicians could benefit from more exposure to it."

Dr. Tidball's interest in country medicine has taken him beyond the borders of San Miguel into more isolated areas. As a volunteer in the local Medical Civic Action Program, Dr. Tidball gives first-aid treatment and medical advice to Negritos (native Filipinos) in a village in the Zambales Mountains. "I can't give them a stable medical program," he says, "because I can't get up there regularly and no local person has any medical training. But it's satis-

fying to help some of them some of the time."

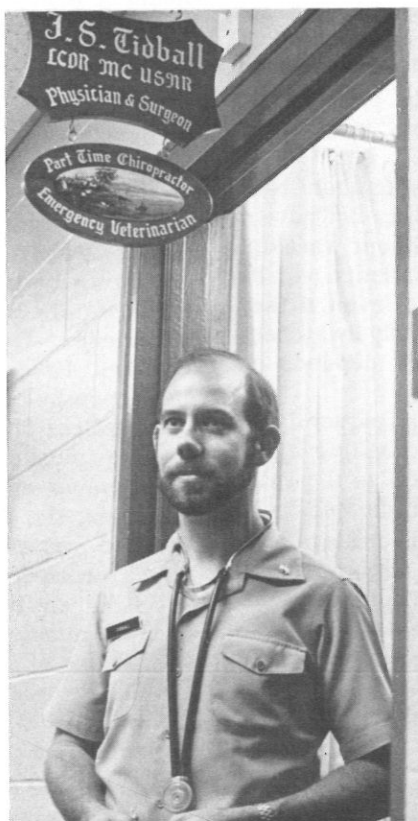
Interesting clinical experience isn't LCDR Tidball's only reward. There are also exciting research opportunities—although not the kind he expected. Intending to study a parasite which had intrigued him in medical school, LCDR Tidball shifted his research interest when he found out the parasite lives only in the southern Philippines. He's now investigating human intestinal capillariasis, a disease caused by *Capillaria philippensis*. "This worm is passed to humans when people eat raw fish that's infected," Dr. Tidball explains. "Over a thousand cases have been reported on the northwest coast of Luzon. Un-

treated, the infection is invariably fatal."

LCDR Tidball has only good things to say about his Navy medical experience. "If it hadn't been for the Navy," says the young medical officer, "I wouldn't have had the chance to come to the Philippines, to meet and live among these friendly people. Being stationed here has been a great experience. I've been able to try out some of the theories I formed in medical school and during my internship. For instance, if you give someone responsibilities and standards, he'll live up to your expectations 99% of the time." He adds, "My corpsmen are the greatest."

Above his office door is a sign that reads: "J.S. Tidball, Lieutenant Commander, Medical Corps, U.S. Naval Reserve, Physician and Surgeon." Beneath it, another plaque reads, "Part-time Chiropractor and Emergency Veterinarian." And since this country physician never knows what medical tasks he'll be handling next, maybe he should add a third sign: "Other Specialties as Required."

—Story and photos by CPO D.B. Hays, Public Affairs Office, Commander in Chief, U.S. Pacific Fleet, Detachment Western Pacific, Box 88, FPO San Francisco 96651.



LCDR Tidball on the job: Only good things to say



Clinical Notes

Diagnosis and Treatment of Migraine

LCDR Russell C. Packard, MC, USN
Donald J. Dalessio, M.D.

Migraine affects approximately 5% to 10% of the general population (1). Although the condition has been around for centuries, our knowledge of it is scanty: we often may not agree on essential criteria to establish the diagnosis. It is difficult to define the migraine syndrome because the frequency and severity of headache vary considerably among patients. Unilateral pain, nausea, vomiting, and a good response to ergotamine are often reported in migraine, but none is uniformly present (2).

In 1962 the American Medical Association defined migraine headache as an episodic vascular headache characterized by recurrent attacks of pain widely varied in intensity, frequency and duration (3). Attacks are commonly unilateral, but may be bilateral, and are throbbing at onset; they are usually associated with loss of appetite and sometimes with nausea and vomiting ("sick headache"). Some attacks may be preceded by or associated with conspicuous sensory, motor, and mood disturbances.

"Common" migraine, which accounts for about 80% of migraine-type vascular headaches, does not have a striking prodrome; it often develops without warning, or builds up slowly. However, most patients will be aware that they are getting a headache, even if they report no more than "a feeling." This early awareness is important because effective treatment depends on rapid administration of ergotamine.

"Classic" migraine, which occurs less frequently, is preceded by visual phenomena such as flashing lights or blind spots in the visual field, often off to the side. Headache occurs when this visual prodrome ends.

Less common types of migraine include cluster headache, and "complicated" migraine in which sensory and motor phenomena (hemiparesis or ophthalmoplegia) may persist during and after the attack.

Although it may begin at any age, migraine usually appears first during teenage years and tends to decrease during the 40's and 50's or during menopause,

but this is not invariable. Patients frequently report a family history of headaches; many patients suffered from motion sickness in childhood.

Migraine may strike anytime and usually lasts several hours, sometimes a day. It is common in the morning when people arise, but may also occur during sleep. It can occur during or after times of stress, as well as during relaxed times, such as weekends and vacations. It may be associated with menstrual periods, high altitudes, hunger, alcohol ingestion, consumption of chocolate, or use of birth control pills. The physician should investigate all these areas when taking the history of a patient with migraine.

Some evidence links cranial arterial distention and dilatation to the painful phase of migraine. Vasoactive substances liberated around the distended blood vessels may also contribute.

It is important that the examiner exclude other disease processes. A careful search should be made for indications of a tumor or other structural lesion. Headache attacks that always occur on the same side may indicate an arteriovenous malformation or a local inflammatory process. When older patients complain of an ocular headache, a sedimentation rate should be obtained to rule out temporal arteritis, and tonometry should be performed for suspected glaucoma. Patients who develop a stiff neck during severe headaches may have subarachnoid hemorrhage; a lumbar puncture should be done to detect blood or xanthochromia in the cerebrospinal fluid.

TREATMENT

Migraine is usually relieved by sleep, and occasionally relieved by vomiting. If given early, various forms of ergotamine often prevent or alleviate the headache. Once the headache is established, however, other analgesics are usually required.

Treating migraine headache with drugs can be one of the most difficult and frustrating experiences in medical practice. The fact that more than 400 migraine remedies have been proposed suggests that *no* chemotherapy has been completely effective.

Regardless of the chemotherapy he prescribes, the physician must devote considerable time and effort to a full appraisal of the underlying mechanisms that produce pain, the patient's personality and response to pain and treatment, and the pharmacologic effects of drugs. A correct diagnosis is central to treatment. Also crucial is an honest physician-patient relationship. After examination, the patient should be reassured that no evidence of a brain tumor or other serious central nervous disorder has been found. The facts about migraine should be explained. If the patient has significant emotional problems, psychotherapy may help.

Treatment of migraine can be divided into two types: relieving symptoms as each attack occurs, and preventing subsequent attacks. Ergotamine tartrate is the best

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drug to treat an attack, but it must be used early in a large enough dose.

Ergotamine's therapeutic effect on migraine is attributed to vasoconstriction. The patient should take the drug at the first sign of a headache, or when he first suspects an attack may occur. Many patients delay using medication until the pain is intense, too late for ergotamine to be effective. It often helps to explain to patients that the drug loses its effectiveness after a headache has lasted about an hour, when the blood vessel wall is swollen from edema and does not respond well to medication. The patient should also be urged to stop all activity and rest for about an hour to help prevent an immediate recurrence of the headache.

Ergotamine is most easily taken in tablets, which are often compounded with caffeine to improve absorption. The drug's main side effect is nausea—a difficult

problem because the migraine patient is often nauseous before taking the drug. If so, sublingual ergotamine or a rectal or antiemetic suppository may be used. Ergotamine should not be given when vasoconstriction is undesirable—to patients with angina, for example.

Although ergotamines are less effective when the headache is already established, an injection of ergotamine tartrate may abort the attack (4). If the patient has already tried common analgesics such as aspirin or acetaminophen, Fiorinal® tablets may be helpful. Codeine or equally potent painkillers must be used with care, and only after less powerful drugs have been tried.

Several agents have proven effective in the prophylaxis of chronic recurring migraine (Table I). Although there is no completely effective way to prevent migraine attacks, these agents can reduce the frequency and severity of attacks in many patients. (It is difficult to appraise prophylaxis because migraines may recede unpredictably for months or even years.)

Methysergide has complex pharmacologic actions, including anti-serotonin activity. Its most feared side effect after prolonged use is the rare occurrence of retroperitoneal fibrosis; the drug should never be taken for more than three consecutive months without a break of at least one month. Propranolol in doses of 40-160 mg daily may reduce the frequency of migraine (5), although the mechanism by which it prevents headache is not certain (6). Recently amitriptyline, an antidepressant, has shown some promise as a prophylactic agent against migraine (7). The relationship of this prophylactic effect to the drug's antidepressant effect is being studied.

Interesting treatment methods that do not involve drugs include biofeedback techniques and control of hand temperature (8). In the latter technique, when the first headache symptoms appear, a temperature feedback trainer is used to raise the temperature of the hand one to two degrees F.; this aborts the headache. The mechanism by which handwarming prevents vascular headaches is unknown, and there are no controlled data on the usefulness of this technique.

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TABLE I. MIGRAINE THERAPY CHART

ROUTE	DRUG	DOSAGE
FOR ABORTIVE TREATMENT		
Intramuscular	Ergotamine tartrate, 0.5 mg	0.5 mg (1 cc) immediately and no more than 3 cc per week.
	Dihydroergotamine, 1 mg	1 cc at hourly intervals, up to 3 cc per day, if necessary.
Oral	Ergotamine and caffeine, 1 mg	2 immediately. Repeat every 20 minutes to a maximum of 6 tablets (10 per week).
	Isometheptene mucate, dichloralphenazone and acetaminophen	2 capsules at once, followed by 1 every hour until pain is relieved; up to 5 capsules in 12-hour period.
Sublingual	Ergotamine, 2 mg	1 tablet immediately, under the tongue. Repeat at 1/2-hour intervals if necessary, but not more than 3 tablets in any 24-hour period.
Rectal	Ergotamine and caffeine, 2 mg	Insert 1 suppository in rectum immediately. Repeat in 1 hour, if necessary.
Inhalation	Ergotamine, 0.36 mg per dose	1 dose immediately. Repeat every 5 minutes to a maximum of 6 doses per day, if necessary.
FOR PROPHYLACTIC TREATMENT		
Oral	Ergotamine tartrate	1 mg twice daily. Skip 1 day a week.
	Methysergide maleate	2 mg three times daily for no longer than three months.
	Propranolol	40-160 mg daily in divided doses.
	Cyproheptadine HCl	4-16 mg daily in divided doses as tolerated.
	Ergotamine, Phenobarbital, Belladonna	1 tablet twice daily.
	Amitriptyline HCl	75-150 mg daily.

Industrial Propellants: Watch Out!

During a routine security check of a P-3 aircraft, an airman found a can of industrial propellant which he thought contained freon. He drove to the far end of the flight line, climbed aboard a TA-18 tug, and on triggering the can's spray mechanism, intentionally inhaled the vapors; he became lightheaded and had visual and auditory hallucinations for about five minutes. After these sensations subsided, the airman walked around for 15 minutes to clear his head, then continued the security check. While he was driving down the flight line, his vision suddenly blurred and he lost consciousness. He awoke in severe pain to find himself pinned between the aircraft fuselage and the tug.

The airman thinks he operated the tug for about two minutes before he lost consciousness. After he blacked out, the tug apparently veered toward the aircraft, increased speed, and struck the aircraft's No. 1 propeller, No. 2 engine, and port landing-gear doors before it became wedged under the fuselage. The tug's instrument panel was forced backward, bending the steering column and trapping the airman. Nearby maintenance personnel heard the crash and immediately called a crash crew and ambulance. It took rescuers 20 minutes to free the victim by lifting the aircraft's nose and releasing air from the tug's tires.

The airman sustained serious injuries:

- Fractured left 10th, 11th and 12th ribs and right 11th rib; displacement of the 10th and 11th left ribs.
- Flail chest, caused by the left rib fractures, requiring tracheal intubation with positive pressure ventilation.
- Left hemothorax due to rib fractures, requiring a chest tube.
- Fractured left transverse processes of the first and second lumbar vertebrae.
- Ruptured spleen, requiring splenectomy.
- Ruptured right kidney, requiring right nephrectomy.

A laparotomy was required for retroperitoneal exploration and resection of the ruptured organs.

The airman's commanding officer said that although the lineman had previously used marijuana, there was no indication he had recently used illegal drugs. The airman had been performing his work well, and was qualified to operate the TA-18 tug and other line equipment. The commanding officer added: "Medical journals have reported chemical propellant abuse; however, recent professional literature crossing my desk has not addressed the subject, nor is the chemical substance abused in this incident given attention in drug awareness programs. Only an omniscient person can anticipate which substance will next be abused."

The aircraft mishap board investigating the accident agreed: it recommended that naval personnel be

educated on the hazards of abusing industrial agents, and that such agents be covered in Navy drug awareness programs.

Information on the toxicity of specific aerosol propellants and industrial solvents and gases can be obtained from the occupational health service of naval regional medical centers, naval environmental and preventive medicine units, or the Navy Environmental Health Center, 3333 Vine St., Cincinnati, Ohio 45220.

—Naval Safety Center, Naval Air Station, Norfolk, Va. 23511.

Halothane: Deadly Drug of Abuse

LCDR J.D. Spencer, MC, USN
CAPT F.O. Raasch, MC, USN

From March 1975 to March 1976, five hospital corpsmen died while sniffing halothane, a general anesthetic stocked in all naval hospitals and many naval dispensaries. The victims were assigned to four different hospitals and one ship. (One of these deaths occurred at a party, where the victim sniffed halothane supplied by another corpsman. The supplier was charged with manslaughter, but was later acquitted.) In all five cases, the drug seems to have been taken illegally from a hospital pharmacy or operating room.

We have previously reported three of these cases (1), and believe it is imperative to alert naval medical personnel to the scope of halothane abuse.

During clinical use, halothane's effect is deceiving. Undoubtedly, the five corpsmen had often observed anesthesiologists using the drug without apparent harm to the patient. They probably had heard about, and perhaps tried "laughing gas" (nitrous oxide). Perhaps they also heard that sniffing halothane causes a "high" similar to that obtained by sniffing glue. But halothane, a liquid packaged in small bottles, is much easier to sniff than nitrous oxide. Halothane can be carried anywhere, and readily volatilizes after it is poured from the bottle. Partially filled bottles of the drug are sometimes left in the operating room at the end of a procedure.

Halothane is not an innocuous drug; an idiosyncratic hepatitis and transient arrhythmias, well known to anesthesiologists, are associated with its use. In one study, 17% of patients undergoing clinical anesthesia developed arrhythmias. Most of these arrhythmias

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were minor, but almost 1% were serious, requiring intervention by the anesthesiologist (2). Halothane also causes respiratory depression, requiring mechanical ventilation.

The exact cause of death from halothane abuse, whether from respiratory depression or cardiac arrhythmia, is uncertain. What is important is that every effort be made to prevent future deaths. We recommend:

- an educational effort to acquaint medical personnel with the drug's dangers.
- access restricted to anesthesiologists for their immediate use.

Halothane is *not* the harmless anesthetic it appears to be. All hospital personnel should be informed of the drug's potential for abuse, and the possibility of sudden death during abuse.

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Contact Lenses: A Closer Look

No one disputes the advantages of contact lenses—that's why millions of Americans wear them. But some of those people don't know there are hazards involved, especially when contact lenses are worn in industrial areas. Many industries prohibit the wearing of contact lenses on the job—for good reasons:

- If a worker loses or misplaces a lens, he may injure himself because he cannot see well.
- A foreign object can become embedded between the lens and the cornea, causing serious eye damage.
- The vapors of many industrial solvents can damage plastic lenses.

The contact lens can impede the flow of tears which normally clean the eye. When caustic alkalies get into the eye, they make deep burns in the delicate eye tissue. Even when done promptly, flushing the eye with water will not always completely remove the alkali trapped under the lens. The few seconds required to remove the contact lens from the eye can mean blindness.

It's clear that people should not wear contact lenses on certain jobs. And wearing safety glasses and protective face shields should be the rule, not the exception. It's a lot easier to take a close look at contact lenses now, rather than a second look after an eye is injured.

--*Pacific Health Bulletin* (July 1976), Navy Environmental and Preventive Medicine Unit No. 6, Box 112, FPO San Francisco 96610.

Elbow Fractures from Explosions in Tight Spaces

LCDR William H. Mitchell, MC, USNR
CAPT James E. Wenger, MC, USN
LCDR Thomas G. Shirreffs, MC, USNR

On 22 November 1975, after the guided missile cruiser USS *Belknap* collided with the aircraft carrier USS *John F. Kennedy*, massive fires and a series of explosions occurred in the *Belknap*. Seven injured members of the *Belknap* were treated in the intensive care unit aboard the *Kennedy*; two had open elbow fractures.

Case 1: This 20-year-old white male was admitted to sick bay aboard the USS *John F. Kennedy* at 0300 on 23 November 1975. The patient sustained 25% second- and third-degree dry flame burns involving the face, right occipital area, back, and both upper extremities. He had minor lacerations and abrasions on his back and buttocks. Clinical and radiographic examination of the left elbow revealed an open fracture dislocation of the left olecranon process. The distal radial pulse was present. The patient was alert and oriented. He reported that he had been thrown against a bulkhead by an explosion.

Case 2: This 21-year-old white male was admitted to sick bay aboard the USS *John F. Kennedy* at 0500 on 23 November 1975. The patient had massive 60% second- and third-degree burns involving his face, head, chest, back and legs. Clinical and radiographic examination of his upper extremities showed an open fracture of the right olecranon, and closed fractures of the left proximal radius and ulna near the elbow joint. This patient also recalled being thrown against a bulkhead by an explosion below deck.

In both cases, the patients suffered severe flame burns and fractures resulting from explosive forces in confined spaces, which threw them into the bulkhead. Both men were alert and responsive afterward.

We suggest that when the force of the explosions threw these men against nearby bulkheads, they attempted to break their fall by partially extending their upper extremity. The suddenness and force of the blast did not afford sufficient time for the elbow to lock, so the olecranon and proximal radius bore the brunt of the blow.

Because the patients were alert and responsive, and because two of the three fractures were open, the examiners' attention was quickly drawn to these injuries. Had the men been unconscious and the fractures closed, the fractures might not have been noticed. We suggest that elbow fractures be suspected when individuals are exposed to blasts in confined spaces.

At the time this article was written, the authors were staff members of the Medical Department, USS *John F. Kennedy*. LCDR Mitchell is now with Naval Regional Medical Center, Portsmouth, Va. 23708. CAPT Wenger is with the Bureau of Medicine and Surgery (Code 51A), 2300 E St. N.W., Washington, D.C. 20372. LCDR Shirreffs is with the National Naval Medical Center, Bethesda, Md.

Radicular Cyst: Report of a Case

Robert F. Provencher, Jr., D.D.S.
LT Stan P. Cowley, DC, USN
LCDR Steven G. Graff, DC, USN
CAPT Thomas W. McKean, DC, USN

The radicular or periapical cyst is an odontogenic lesion associated with a tooth root. The cyst results from epithelial proliferation within a granuloma: pulpal infection, caused by caries or trauma, may cause periapical inflammation, leading to the formulation of granulomas characterized by stratified squamous epithelial cells from the rests of Malassez. Persistent inflammation and infection cause these squamous epithelial cells to proliferate at the edge of the cyst and deprive its center of essential nutrients. Necrosis and liquifaction occur within the core of the cyst, resulting in a well defined epithelial cavity filled with fluid.

These lesions are usually painless. Enlarged, they may cause adjacent bone to expand. On a radiograph, the lesions are impossible to distinguish from simple granulomas (1).

CASE REPORT

A healthy, 37-year-old male on active duty in the military was referred to Naval Regional Medical Center Oakland, Calif. with the chief complaint of pain in the anterior mandible. Paresthesia of the lower lip increased when the patient chewed. The patient recalled occasional swelling, without drainage, in the anterior labial vestibule. On 29 March 1976, the patient was admitted to the Oral Surgery Service for further diagnosis and for treatment.

Dr. Provencher is in private practice at 87 Hall St., Manchester, N.H. 03103. At the time this article was written, he was a lieutenant commander in the Navy Dental Corps, and a staff oral surgeon at Naval Regional Medical Center Oakland.

Drs. Cowley, Graff, and McKean are with Naval Regional Medical Center Oakland, Calif. 94627. LT Cowley is a resident in general dentistry, LCDR Graff is a resident in oral surgery, and CAPT McKean is chief of the Dental Service and Oral Surgery Division.

The authors thank CDR Philip Vogt (MC), LCDR Bowen Asserson, Jr. (MC), and HM1 Steven P. Spring for their assistance.

His past medical history and a review of systems revealed nothing that related to his current problem. There was no history of trauma to the area. No recent dental work had been done in the area.

On physical examination there was a palpable left jugulodigastric lymph node and mild paresthesia of the lower lip on the left. Results of routine admission laboratory tests and a chest X-ray were within normal limits. On intraoral examination there was slight fullness in the left mandibular vestibule next to the cuspid tooth. The crown of the left mandibular lateral incisor was discolored. No bruit or thrill was detected on auscultation and palpation of the swollen area. The pulp of the left mandibular lateral incisor and first premolar did not respond to electric testing.

Panorex and periapical radiographs of the mandibular teeth showed a well delineated radiolucent lesion extending from the first premolar to the right cuspid (Figure 1). A sclerotic rim surrounded the lesion, extending upward between the anterior teeth. No previously taken radiographs of the area were available to establish the origin or growth rate of the lesion.

Based on the radiographic and clinical findings, our possible diagnoses were:

I. Reactive (Inflammatory)

- Abscess
- Cyst
 - Odontogenic
 - Aneurysmal
 - Traumatic bone

II. Neoplastic

- Odontogenic
 - Ameloblastoma
 - Myxoma
- Non-odontogenic
 - Giant cell tumor

The sclerotic border of the lesion and associated nonvital teeth pointed to a reactive process, but an infectious neoplasm could not be ruled out.

After we confirmed that the left lower first premolar and lateral incisor were nonvital, we aspirated the lesion, obtaining purulent exudate. A mucoperiosteal flap was reflected from the necks of the anterior teeth and the mandibular symphysis was exposed in a degloving procedure. A large cystic lesion was then dissected and curetted free (Figure 2). Root canal work was performed on the left lower premolar, cuspid, and lateral incisor, using



FIGURE 1. Panorex film shows radiolucent lesion in mandibular symphysis. Note the sclerotic rim of the lesion, and interdental scalloping.

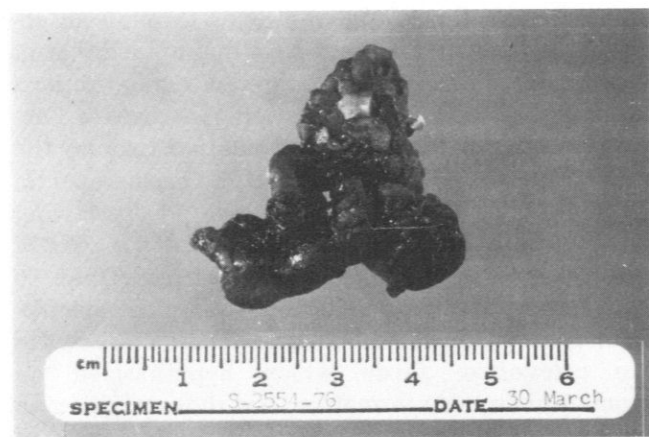


FIGURE 2. Cystic lesion dissected and curetted free from mandibular symphysis.

gutta-percha as filler. After the bony margins of the lesion were thoroughly curetted, the surgical site was closed primarily. A pressure dressing was placed on the patient's chin to control postoperative edema. The patient tolerated the procedure well. He did not develop a fever; the surgical site did not swell.

During follow-up examinations, we noted that the surgical site was healing well (Figure 3). The patient did not complain of residual tenderness or paresthesia, or of recurring edema.

Histopathologic studies showed that the tissue removed at biopsy came from a cyst without a neoplasm. Some areas of this lesion were characterized by attempted rete peg formation, dense inflammations interrupting the thick and thin epithelial lining, and Rushton bodies within the epithelial lining (2) (Figure 4).

DISCUSSION

Clinicians who encounter a radiolucent jaw lesion should scrutinize the associated clinical and radiographic data. It is important to distinguish between a follicular cyst and a radicular cyst, because tumors



FIGURE 3. This postoperative panorex film illustrates root canal therapy in the left mandibular first premolar, cuspid, and lateral incisor.

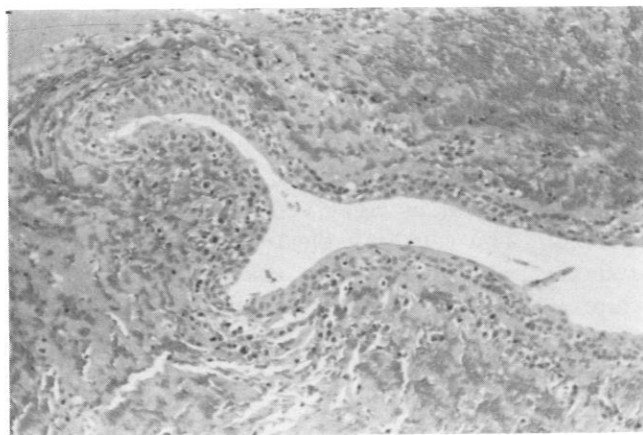


FIGURE 4. Radicular cyst with thick and thin epithelial lining interrupted by areas of dense inflammation.

are more likely to form in follicular cyst walls. Because the radicular cyst in the case reported above was diagnosed and treated quickly, there was no residual deformity.

SUMMARY

A 37-year-old white male presented with a large radiolucent lesion in the mandibular symphysis. After excisional biopsy, the lesion proved to be a radicular cyst. During a one-month follow-up, the surgical site healed without complication.

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Wolff-Parkinson-White Syndrome: An Analysis of Its Pathogenesis

ENS Felipe C. Robinson, USNR

In 1930 Wolff, Parkinson and White published their report, "Bundle-Branch Block with Short P-R Interval in Healthy Young People Prone to Paroxysmal Tachycardia" (14). Since then, several investigators have tried to pinpoint the mechanism they believed to cause this dysrhythmia: shortened atrioventricular (A-V) conduction through an anomalous bundle, avoiding the normal delay in conduction through the A-V node. This theory was supported by the ingenious experiments of Butterworth and Poindexter (2), who created an electrical A-V communication by using sino-atrial node action potentials, increased by a vacuum tube amplifier, to stimulate the left or right ventricle before normal excitation. The resulting electrocardiograms simulated the pattern noted in the Wolff-Parkinson-White (WPW) syndrome. Butterworth and Poindexter also generated supraventricular tachycardia by reversing the system's polarity and transmitting ventricular action potentials back to the atria.

On an electrocardiogram, WPW is diagnosed during sinus rhythm by a short P-R interval and a prolonged QRS complex widened in its initial portion by an anomalous, slowly rising "delta wave." An ST-T wave is frequently seen moving in the opposite direction of the delta wave; supraventricular ectopic rhythms also occur (10).

On vectorcardiograms, the abnormal direction and slowness of inscription of the initial QRS deflection (delta vector) can be defined more accurately. By separating the delta vector from the QRS vector, the syndrome can be classified according to the discordance or concordance of the two vectors. Vectorcardiogram studies also show the spread of activation through the ventricles (7).

The incidence of the WPW syndrome in nonhospitalized people is not known. In limited studies of

hospitalized children, however, from 0.05% to 0.86% had this dysrhythmia; from 54% to 70% of the affected children were male (10).

Since the WPW syndrome is seen frequently in children and occasionally in families, some researchers believe the syndrome to be caused by a congenital anomaly of the A-V conduction system, with pre-excitation of the ventricles through an accessory pathway (1). Others have maintained that at least some of the electrocardiogram configurations noted in the WPW syndrome represent disease "acquired" when part of the A-V node fails to delay the atrial impulse, or when conduction accelerates in malfunctioning areas of the A-V node (8). Reviewing the literature on the pathogenesis of the WPW syndrome, Wolff, in 1954, noted that more than 60 theories had been formulated to explain the electrocardiogram pattern (13). He divided these theories in two categories: those which hypothesized an anomaly of impulse formation, and those positing an anomaly of impulse conduction. Both types of theories, Wolff pointed out, involve premature activation of a small part of the ventricular musculature, producing a shorter atrioventricular conduction time.

After Butterworth and Poindexter showed that ventricular pre-excitation can be explained by an electrical connection between atrium and ventricle, some researchers considered the WPW syndrome to be identical to the "bundle of Kent syndrome" (5). But further investigation using histological techniques, epicardial mapping, His bundle electrograms, and vectorcardiograms with esophageal electrodes showed that there are many kinds of ventricular pre-excitation, and many accessory pre-excitation pathways. Zipes, et al. (16), in an electrophysiological evaluation of five patients with the pre-excitation syndrome or supraventricular tachycardia, provided clinical evidence that accessory fibers may vary greatly. These five patients usually responded to pre-excitation with:

- failure to depolarize the His bundle from the site of ventricular pre-excitation.

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- supraventricular tachycardia with two types of re-entry.
- anterograde block in the accessory pathway, with intact retrograde conduction.
- retrograde delay or block in the accessory pathway and A-V node, with intact anterograde conduction.

Lev, et al. (6), reporting on a patient with an unusual intermittent WPW syndrome, noted that at the autopsy 18,600 serial sections through the entire conduction system and both A-V rims revealed no bundle of Kent. Instead, Mahaim fibers histologically identified as His bundle tissue rose from the A-V bundle and projected to the right and left sides of the septum along with the normal fibers of James.

Studying the pathways of tachycardia in 71 patients with the WPW syndrome, Wellens and Durrer (12) used intracavity recordings and atrial and ventricular stimulation to start and end the tachycardia with appropriately timed electric stimuli. This study demonstrated that programmed electric stimulation of the heart, combined with intracardiac His bundle recordings, can help define the role of accessory pathways during tachycardia in patients with the WPW syndrome. Based on findings that suggested accessory pathway participation or A-V nodal reentry, Wellens and Durrer classified the pathways of tachycardia in patients with and without the WPW syndrome. Of the patients with the WPW syndrome, tachycardia followed an accessory pathway in 73%, A-V node reentry in 11%, and an undetermined pathway in 16%.

Coumel and Attuel (3) described a phenomenon they called "paradoxical capture": if bundle-branch block was present during tachycardia in a patient with the WPW syndrome, a premature beat in the ventricle of the blocked bundle branch could be followed by a V-A interval shorter than the V-A interval of the tachycardia complexes. Under these circumstances the A-Ae interval is shorter than the interval between QRS complexes during tachycardia and induced ventricular premature beat. Coumel and Attuel explained this finding by hypothesizing that the induced stimulus prematurely excited the pathway of tachycardia before the arrival (delayed by the bundle-branch block) of the excitation wave responsible for tachycardia. The "paradoxical capture" is induced most easily if, during tachycardia, bundle-branch block occurs in the ventricle in which the accessory pathway inserts, and in which the premature stimulus is induced.

Denes, Wu, et al. (4) demonstrated two A-V nodal pathways in patients with paroxysmal supraventricular tachycardia, suggesting that the A-V node can

dissociate longitudinally into two pathways with different functions. Using His bundle recording and atrial extra stimulus in patients with two P-R and A-H intervals, Denes and his colleagues demonstrated discontinuity in the A_1 - A_2 and H_1 - H_2 curves, suggesting two A-V nodal pathways. In a later report (15), these investigators searched for the determinants of fast and slow pathway conduction in patients with dual A-V nodal pathways. They performed His bundle electrograms on two patients whose paroxysmal supraventricular tachycardia followed dual A-V nodal pathways (evidenced by the atrial extra stimulus technique). They found that fast and slow pathway conduction at the same cycle length depends on an effective refractory period that is long and fast compared to the spontaneous or driven length. During fast pathway conduction, a shift to slow pathway conduction could be induced at critical cycle lengths by a premature atrial impulse within the fast pathway's effective refractory period. Repetitive retrograde concealed conduction to the fast pathway then maintained anterograde slow pathway conduction. Resumption of fast pathway conduction was induced with premature atrial impulses introduced within the effective refractory periods of both fast and slow pathways, thereby allowing the fast pathway to recover for anterograde conduction. Paroxysmal supraventricular tachycardia reentered the A-V node when the slow pathway was delayed long enough for the fast pathway to recover for retrograde conduction. The researchers also noted that shifts from fast to slow pathways can change ventricular activation; the mechanism by which this change occurs is unknown.

Dual A-V nodal pathways have many implications. For example, a double ventricular response to a single P wave can occur if the slow pathway conduction time is long enough to allow the distal His-Purkinje system and ventricle to recover for re-excitation.

The pathogenesis of the WPW syndrome has not been pinpointed. At best, we can generalize that the WPW syndrome may be produced by a bundle of Kent; a tract from the atrial septum to the A-V bundle, bypassing the A-V node with fibers of Mahaim; the normal fibers of James with fibers of Mahaim; or, in complex congenital heart disease, two A-V nodes forming a common bundle with or without fibers of Mahaim (5).

Electrocardiographic and vectorcardiographic techniques provide the information needed to diagnose and classify pre-excitation in the WPW syndrome. In 1945, Rosenbaum, et al. (9) suggested

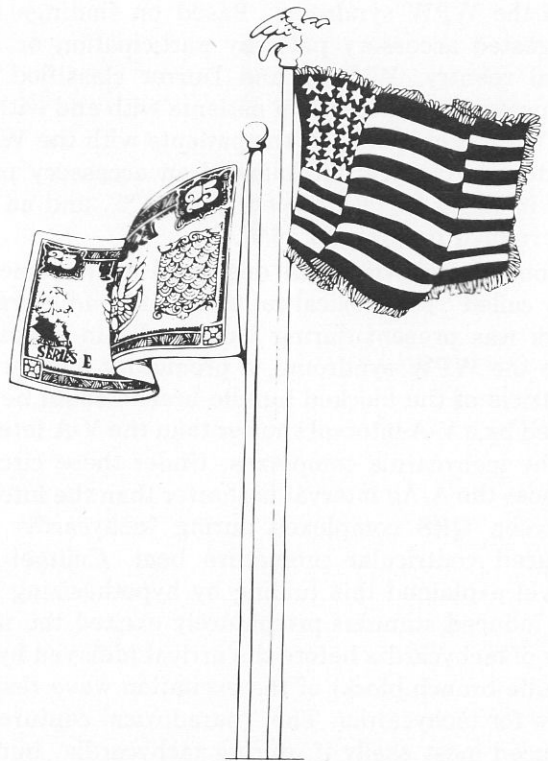
that WPW electrocardiograms be classified in two types, A and B, based upon whether the maximum QRS forces in the right precordial leads are directed anteriorly or posteriorly. Their hypothesis—that different QRS morphologies result when the ventricular myocardium is activated over accessory connections at different sites—has since been reconfirmed; however, more recent techniques of epicardial mapping, His bundle electrocardiograms, and surgery have shown the Rosenbaum system to be grossly oversimplified. We now know that accessory pathways may cause pre-excitation at multiple sites. Electrocardiograms and vectorcardiograms help to identify the accessory pathway because initial depolarization forces can be used to localize the epicardial activation sequence (11). The first part of the delta wave results from propagation over the accessory pathways, and from subsequent excitation of the myocardium next to the mitral or tricuspid annulus. The rest of the QRS complex is caused by different degrees of fusion from propagation over normal and accessory conduction pathways.

No single theory of pre-excitation fully explains the pathogenesis of the WPW syndrome. More investigation is needed into the anatomic features of normal and aberrant conduction systems. Further use of epicardial mapping, His bundle electrograms, electrocardiograms and vectorcardiograms should produce greater understanding of this syndrome's pathogenesis.

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**Fly High With the Best
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Off Duty

Stalking the Perfect Bloom

"Like they say in the commercial, you can't stop at just one," says DT1 Don Myers, an oral histopathology lab technician at Naval Regional Medical Center San Diego. He's talking about his off duty passion: orchids.

"Once you've successfully cultivated one variety of orchid," says the hothouse habitué, "it's hard not to grow more."

"I began about 10 years ago," DT1 Myers explains, "after I visited a local commercial grower when I was first stationed in San Diego. I was going to buy just one orchid plant and grow it in my back yard. The one I picked blooms in the spring; when I saw how beautiful it was, I thought I'd get another that blooms in a different season."

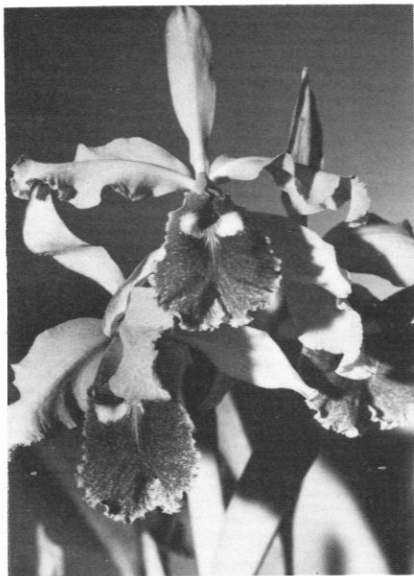
"Then," he continues, "I was transferred to Great Lakes. While orchids grow almost anywhere, Northern Illinois doesn't provide the most favorable climate. But after my tour there, I returned to San Diego, and my wife and I soon had orchids growing year-round. When we added a greenhouse behind our mobile home, we knew we were hooked."

In fact, the couple are so enthralled with orchid culture that they plan to become commercial growers. "We're buying small plants from all over Southern California," DT1 Myers says. He has accumulated about 500 plants, but will need at least 3,000 to start his business.

After several years of nurturing orchids, DT1 Myers is an expert on the exotic bloom. At the drop of a petal, he'll tell you that there are 88 subtribes, 660 genera, 25,000 species, and more than 60,000 registered varieties. "With even more varieties being developed through hybrid cross breeding," he

says, "the orchid is one of the largest families of flowering plants."

There's a lot of misinformation about orchids, DT1 Myers says. Contrary to popular belief, they're not parasites like mistletoe, which feeds by fastening its roots to the bark of a tree. Many orchids are air breathing—they grow on rocks and trees, their roots drawing moisture from the air. Other orchids are terrestrial, growing in the ground with a root system close to the soil's surface.



The elusive goal: a perfect bloom

Any young man who has ever bought an orchid corsage for a date wonders why they're so expensive. "The main reason for the price is demand," says DT1 Myers. "Orchids that bloom at Christmas, Valentine's Day, Easter or Mother's Day bring a higher price." But orchid prices vary: while some prize-winning hybrids can cost thousands of dollars, many orchid plants cost considerably less—\$7.50

to \$15 for a healthy, ready-to-bloom plant. And when you consider the plant's life expectancy—almost incalculable, since they can be divided every two or three years—it's a fertile investment.

To grow an award-winning orchid takes ingenuity and a bit of luck. "One grower might produce an award-winning cross between two parent orchids, while another grower, using the same type parents, might end up with a totally different offspring," explains DT1 Myers. "That's what makes orchid growing so interesting."

What makes a particular hybrid a prizewinner? "Trained judges certified by the American Orchid Society examine the shape, substance and consistency of the flower, and its relation to the plant," says DT1 Myers. "If the orchid wins a gold, silver or bronze award, the grower's name and the name of the new orchid are listed in the American Orchid Society Registry, which is updated every five years." Discovery of a new species is rare.

DT1 Myers advises the novice orchid buff to remember the basic requirements for orchid growing: sufficient light (but not direct sunlight), adequate drainage, warm temperatures by day and cool temperatures at night. If you take up this unusual pastime, you'll have some famous company. While orchid growing is no longer limited to the rich and powerful, there are some prominent collectors, among them actors Jim Nabors and Raymond Burr.

Asked if he has ever seen the infamous and rare black orchid, DT1 Myers replied, "Only in Brenda Starr." Defusing a popular myth, he explains that the closest an orchid has ever come to black is a deep brown shade.

That still leaves 60,000 other varieties from which to choose. But remember . . . you can't grow just one.

—John Naccarato, *The Dry Dock*, Naval Regional Medical Center San Diego, Calif. 92134.

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